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A CASE STUDY IN INDUSTRIAL DEVELOPMENT —
THE GROWTH OF THE PULP AND PAPER INDUSTRY IN INDIA

John C. Eddison

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A CASE STUDY IN INDUSTRIAL DEVELOPMENT--THE GROWTH OF THE INDIAN PULP AND PAPER INDUSTRY

by

John C. Eddison, Ph.D.

Publication of this study has been made possible by the Center for International Studies. The author has not been a member of the Center's staff, but his research is directly related to the Center's research program on economic and political development. The work was done in close association with members of the Center's staff.

Center for International Studies
Massachusetts Institute of Technology
Cambridge, Massachusetts
February 1955

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PREFACE

Industrial expansion will be a major objective of India's Second Five Year Plan. Unofficial sources have suggested a doubling of India's industrial output as a specific target over the five year period 1956-1961. Even if this goal were adopted and achieved, the process of creating a modern industrial economy would still be in its early stages by 1961.

Excluding Japan, India is today the largest producer of industrial goods in Asia. "Modern" large-scale factories for milling cotton and jute were first established a century ago--and the Tata Iron and Steel Company is almost fifty years old. There has been expansion and diversification both in consumer and producer goods. Despite these early beginnings, manufacturing activities today provide about 15 per cent of India's national income. Moreover, more than half of this is still accounted for by small enterprise and handicraft industries, many of which do not have the advantage of modern forms of power. Even the doubling of industrial output in India during the next Plan might still be consistent with a modern industrial sector which employs less than 5 per cent of India's labor force and provides but 10 per cent of total national output. It seems clear that problems of the appropriate rate of industrial investment, and of which industries and which methods of production to encourage, will long occupy planners and investors in India.

In its general research program on the process of economic growth, the Center for International Studies expects to analyze such alternative possibilities which confront countries in early stages of industrial expansion. Indian material is of unusual value in this respect; one can study the experience of a variety of going industries. As part of its research program, therefore, the India Project of the Center has encouraged studies of individual industries for which systematic analyses were not already available. The present study was submitted as a doctoral dissertation in economics at the Massachusetts Institute of Technology. Its author brought to it not only his recent training in economics and industrial relations, but his early background as an industrial engineer with some familiarity with the paper industry of the United States.

Mr. Eddison points up the scope for increasing efficiency of operations as the Indian paper industry expands to meet basic needs in a developing economy. He argues the advantages of the larger operating units in the industry and suggests the possibility of management arrangements for groups of relatively large units. Small-scale, labor intensive methods do not appear to be economic in this industry, given the present technological alternatives. In particular, they seem not only to have higher labor costs, but also higher capital costs per unit of product.

Two additional monographs in this series of industry studies will be published in the near future. The first deals with the Indian cement industry. Among other things, this provides an opportunity to examine an industry where there is a long experience with an association of large-scale enterprises. The second report will deal with industrial growth in a region, as distinct from a specific industry. On the basis of experience in the Bangalore area, the analysis deals particularly with problems confronting management in the fields of finance, managerial organization, and labor relations.

The Center is happy to make possible a broad distribution for Mr. Eddison's study. It would welcome reader reactions to the work, and suggestions for further investigations. The Center has been glad to provide its facilities to Mr. Eddison. As with all publications of the Center, however, the findings and judgments contained in this study are the personal responsibility of the author and not of the Center for International Studies.

Wilfred Malenbaum
Director, India Project
Center for International Studies

Cambridge, Massachusetts
May 3, 1955

FOREWORD AND ACKNOWLEDGMENTS

I should like to preface this case study with a few words of caution to the reader. Being neither a paper making expert nor a long time student of India, I have not tried in this single industry study to deal exhaustively either with technological aspects of paper manufacturing or with over-all problems of the nation's economic evolution. Rather I have attempted to give a balanced and relatively comprehensive economic exposition of the factors and conditions which have in the past affected, and which may in the future be expected to influence the development of Indian paper making. Because my research was centered on the organization and performance of the pulp and paper industry *per se*, my data have not permitted either a global evaluation of the role of paper making in the total industrial picture or a very extensive treatment of interindustry relationships.

Indian and other non-American readers will probably note an American orientation not only in the terminology and the frame of reference of this study but also in certain concepts expressed or implied in it. Although I have attempted to be as objective as possible in evaluating the potential and the performance of the Indian paper industry, I am aware that my appraisals have not been entirely free of the prepossessions of one trained in a Western, industrial environment.

Having offered these *caveats*, I would now like to express my manifold thanks to many individuals and to many institutions for the assistance which I received in the performance of research for this study and in the preparation of this manuscript. Because the number of such persons and of such organizations runs into the hundreds, it will not be possible to thank each one by name. I must, therefore, confine myself to a general expression of sincere appreciation to all who helped me on my way, and to a limited number of additional, specific acknowledgments.

The first of these is to the Ford Foundation which, by granting me a Foreign Study and Research Fellowship, made possible my trip to India and the gathering of all the research data on which this study is based. However, I should like to make it clear that neither the Ford Foundation nor any other individual or organization named below is in any way responsible or accountable for any of the statements or views expressed in the following pages.

My second bow of gratitude is to the Government of India and to its representatives on the Planning Commission, in the Development Wing of the Ministry of Commerce and Industry, in the Forest Research Institute, and in many other agencies, who cheerfully provided me with much valuable information.

My third acknowledgment of substantial indebtedness is to the Indian paper industry and to the managing agents, managing directors, and personnel of its twenty mills, as listed in Table I of Chapter 1. But for the generous hospitality of the paper makers in granting me access to their mills and to their records and in giving me liberally of their time, this report could have been little more than a reworking of secondhand material. In particular I should like to thank the Karam Chand Thapar and Balmer Lawrie organizations and the Messrs. J. C. Aggarwal, W. P. Bookless, K. Hottenroth, A. W. Jeffrey, Kurt Kauer, C. J. E. Keene, John Linggood, J. C. Lowe, William Marshall, R. M. Mehta, Roy Rivers, J. N. Sardana, S. Roy Turner, and M. S. Parkhe (of Paper and Pulp Conversions Ltd., not listed in Table I) for the especial efforts which each made to assist me in my research. In addition, I would like to express appreciation to those who showed me the handmade paper industry in Poona and in Sanganer Village, and to express my regret that as an economist I have been unable to deal more generously with their altruistic enterprise.

Other individuals who were most helpful to me while in India were Dr. M. M. Mehta of Nagpur, Mr. A. Subbiah of Madras, the Messrs. H. M. Ghosh, Neil McInnes, I. H. Nish, and D. F. N. Rowlatt of Calcutta, representatives of the Ford Foundation and of the U. S. Technical Cooperation Mission in New Delhi, personnel of Dodge Seymour and Company Ltd. in Bombay and of the U. S. Consulate in Calcutta, Mr. Eric da Costa, Editor of the Eastern Economist, and Mr. Frederick C. Shorter, a transient scholar like myself.

I am also very grateful to officials of the Forestry Division of the U. N. Food and Agriculture Organization in Rome and to the managements of the Kieckhefer Container Co. and of the Scott Paper Co., in the U.S.A., for their contributions to my understanding of paper manufacturing at home and abroad.

For advice which I have received in conducting my research and in preparing this study I am most grateful to the staff of the Center for International Studies and to members of the faculty of the Department of Economics and Social Science at the Massachusetts Institute of Technology. My particular thanks in this respect go to Professors Charles A. Myers, Max F. Millikan, Wilfred Malenbaum, Morris A. Adelman, and George B. Baldwin. I would add also my appreciation to those who were responsible for the typing of this final draft.

My final tribute is to my parents who have sustained me in many ways while this thesis was in progress, and to my typist, bibliographer, editor, baby tender, spelling expert, and source of strength, my Wife, to whom this work is dedicated.

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PART I

The Economic Structure

CHAPTER 1

Pulp and Paper Making in the Indian Economy

This is a case study of industrial development whose intent it is to combine an exposition of the economics of a specific industry with an exploration of the factors, the forces, and the obstacles which are involved in the growth of that industry in a particular country. The country chosen for study has been India, where an enormous effort to achieve economic progress along democratic lines is currently being made. The protagonist selected to illustrate industrial growth on Indian soil has been the pulp and paper industry.

The choice of this industry was based on a number of considerations. Among them were its important role in Indian economic development, its varied background and history, and its amenability to inspection and analysis. Its role in the nation's development is primarily that of supplier of one of the chief requisites to a program of vastly expanded literacy and education, namely printing and writing paper. This industry also plays secondary roles, as do other domestic industries, as employer of otherwise unutilized physical and human resources and as contributor to increased national product and balanced industrial growth. Its history, as will be seen, goes back more than three-quarters of a century and includes periods of surfeits and starvation, of *laissez-faire* and extensive government intervention, of hyperconservatism and of speculative risk taking. From the point of view of adaptability to study, the paper industry consists of only twenty mills, nineteen of which were actually visited. These mills are scattered over eleven states, but the general offices of most of the larger firms, the two paper manufacturers' associations, and the one industry publication are all concentrated in Calcutta.

The case study approach was undertaken with the objective of gaining insight into economic, cultural, and political factors affecting the growth of Indian industry in general, through a careful appraisal of one segment of the industrial whole. It was felt that first hand information about Indian industry was in rather short supply and that insufficient attention had been paid by economists to empirical studies of industrial growth in this critically important country. An additional incentive to making such a study was the desire to learn more about entrepreneurship, industrial management, and the place of large scale industry in a developing economy. The pulp and paper industry provided opportunities to explore all of these interests.[1]

The making of paper in India by primitive hand methods dates back many centuries, but the first mechanically powered, commercial mill did not appear there until 1865. This concern, organized and operated by British interests, was called the Royal Paper Mills Limited and was situated at Bally, a village on the Hooghly River just north of Calcutta.[1] It was the only Indian paper mill until 1879 when another small unit was started at Lucknow. The first pronounced growth of paper making began in the 1880's in response to a government promise to give preferential treatment to indigenous manufactures. This declared policy and the high level of paper prices at that time stimulated the development of five new mills. Their combined production, based on the use of rags, jute cuttings, waste paper, and to an increasing extent, *moonj* and *sabai* grass, had reached 19,000 tons in 1900.[2]

---

[1] To the writer's knowledge, no comprehensive economic study of the Indian pulp and paper industry has ever before been made. The method followed in obtaining data for this study is summarized in Appendix I.

For the next three decades the industry made very limited progress. Heavy imports of cheap paper made from European wood pulp forced several of the mills into bankruptcy and, except for a respite during World War I, sharply limited the profits of survivors. The imposition of a protective tariff in 1925 and the development of bamboo as a source of paper pulp in the early nineteen thirties improved the economic environment for paper making considerably. A burgeoning of new mills and a doubling of output soon followed. In the financial year (April 1 to March 31) 1933-1934 seven mills produced 44,000 tons of paper.[1] Ten years later, fifteen manufacturing units were turning out 101,000 tons,[2] and by the end of 1953, the output of nineteen mills stood at just under 139,000 tons.[3] In recent years, approximately two-thirds of this output has consisted of so-called "cultural" paper, i.e., printing and writing paper, while slightly less than one-third has been made up of wrapping paper and paperboard. The Government has been the principal purchaser of this domestically made paper, consuming from 35 to 40 per cent of each year's production and leaving the balance to the internal civilian and industrial markets.

---

[1] The mill at Bally was not actually the first producer of machine made paper in India. More than three decades earlier a paper machine had been imported from Scotland and put into operation in the nearby town of Serampore. This machine was used by a famous Baptist missionary, Dr. William Carey, and his followers to make the paper on which were printed Carey's translations of the Bible into indigenous languages. It is not clear why Carey's mill failed, although a contributing reason is said to have been the unwillingness of the Government to buy his paper. The equipment from this missionary mill was subsequently used in starting up the plant at Bally. "A History of Papermaking in India," Brochure, All-India Printers Conference and Exhibition, Calcutta: 1954, p. 25.

[2] *Ibid.*, p. 29. It should be noted that these figures are in long tons (2240 lbs.) in conformity with Indian practice. U.S. figures are normally reported in short tons (2000 lbs.) while United Nations reports frequently use metric tons (2204.6 lbs.). In this report, unless otherwise specified, *tons* will be used to mean long tons.

---

[1] Government of India, Report of the Panel on Paper, Pulp, Board and Chemical Cotton Industries, Lucknow: Pioneer Press, 1947, p. 39.

[2] This figure is from the records of the Government of India, Ministry of Commerce and Industry, Development Wing, April, 1954.

[3] This is my own figure based on an estimate of the Planning Commission of the Government of India which was made available to me in April, 1954.

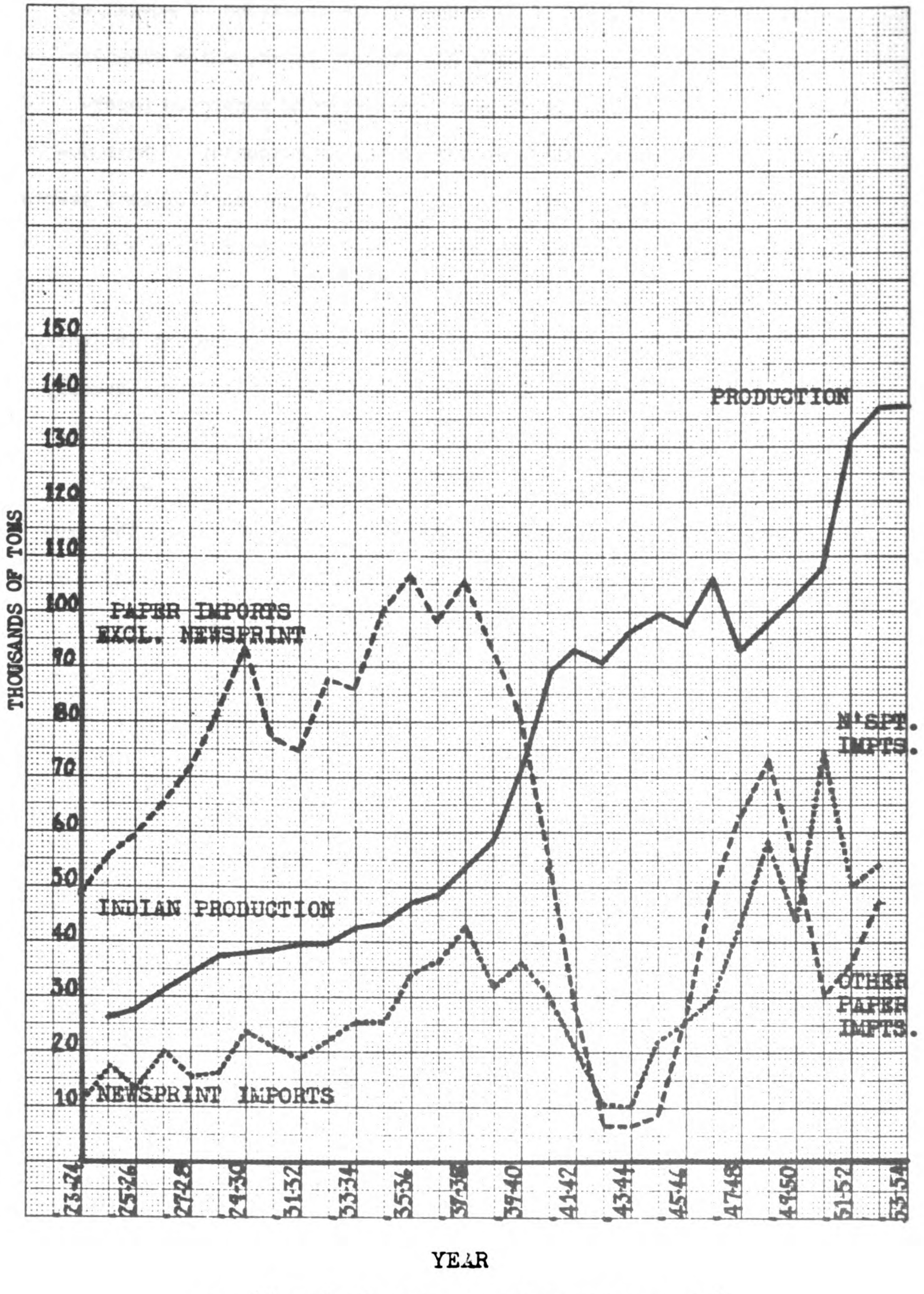
The exact number of mills depends on where one draws the line between the manufacture of paper and paperboard on the one hand and of strawboard, millboard, or pulpboard on the other. Paperboard is a high grade of what is colloquially known as cardboard and is composed of multiple layers of paper or paper pulp. The other types of boards are made from inferior grades of pulp not suitable for paper making. The paper and the board industries are usually considered as separate entities but the dividing line between them is not clear-cut since paper mills sometimes make pulpboards and some board mills make low grade papers.

This study includes only those firms which are primarily engaged in the manufacture of paper and paperboard in mill scale units. Excluded from coverage here, therefore, are the producers of handmade paper, strawboard, and cellophane. Also excluded is the Pudukottai Paper Mills, a small experimental unit in South India which recently failed in an attempt to manufacture marketable paper from the leaves of the palmura, a species of palm tree.

As of 1953 there were no mills manufacturing newsprint in India, but a new unit, the National Newsprint and Paper Mills Ltd. (usually referred to as Nepa), was under construction and was expected to go into production late in 1954. The absence of already established newsprint plants is attributable not to lack of markets for the product but rather to the unavailability of suitable raw materials for its manufacture. The new mill will attempt to utilize fibrous materials not hitherto thought suitable for the process. Its prospects for success will be discussed in Chapter Nine.

The growth of Indian paper production over the past thirty years is traced in Fig. 1 where it is compared with the volume of annual imports (newsprint being shown separately from other paper imports) over the same time span. The quantitative ascendency of domestic over imported paper, which was established from 1940 onwards, resulted from continuing tariff protection, from the increasing use of bamboo, and from wartime shortages of European paper. The dislocations which accompanied the achievement of independence and the agonies of partition caused a temporary falling off of output in

FIG. 1 THE GROWTH OF INDIAN PAPER PRODUCTION COMPARED WITH IMPORTS OF NEWSPRINT AND OTHER PAPER 1923-24 TO 1953-54[(a)]



a. (for footnote, see following page)

1947 and 1948, followed by a sharp recovery in 1951. Growth of output since 1951 has been held back by strikes in several of the mills and by a temporary business recession during the summer of 1952. Increases in mill capacity have continued, however, despite these retarding influences so that it seems highly probable that the production target of 200,000 tons (exclusive of newsprint) set by the Planning Commission for 1955-1956 will be reached. In the case of newsprint, the production goal for 1955-1956 has been set at 27,000 tons, the anticipated output of the Nepa mill, even though the demand for this type of paper is expected to be more than three times that amount.[1]

Although one would be hard put to find what might be called a representative Indian paper mill, the majority of paper producing units in India would answer fairly closely to the following description. They are integrated, single mill firms, combining in one factory

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Footnote to Fig. 1. Indian production data up to 1942-1943 were taken from the Report of the Panel on Paper..., op. cit., p. 39. Production totals for the last ten years are those of the Development Wing of the Ministry of Commerce and Industry. Import figures were extracted from the Annual Statement of the Foreign Sea-Borne Trade of India, Delhi: Manager of Publications, for the appropriate years prior to 1950-1951. Import figures from 1950-1951 through 1952-1953 were taken from Accounts Relating to the Foreign (Sea, Air, and Land) Trade and Navigation of India for March and September, 1953, Calcutta: Government of India Press, 1953.

[1] Government of India, Planning Commission, Programmes of Industrial Development 1951-1956, Delhi: Manager of Publications, 1953, p. 177.

the production of both pulp and paper. Their productive facilities include, along with the pulp and paper making equipment, a powerhouse, a chemical recovery unit, a water treatment plant, maintenance shops, and a mill office. Almost all of the firms include living accommodations for top supervision while more than half of them provide extensive worker housing on the mill compound. Seventeen out of the twenty mills are privately owned and operated while three are managed by state governments. Of the privately owned concerns, fourteen are operated by managing agencies and three by managing directors. In only two of the privately owned firms are the head offices located at the mills.

The size of each of the paper mills in India measured in terms of output, capacity, and employment for the year 1953 is shown in Table I. The range in size will be seen to be wide, especially in regard to production and capacity. The annual production total for the industry was estimated by the Planning Commission as being slightly over 138,000 tons, giving a mean output of 7,700 tons per mill.[1] Both the industry total and the mill average would have been higher but for major strikes in the Titaghur and Bengal Paper Mills. Production losses attributable to these work stoppages are estimated to have been from 7,000 to 8,000 tons for the year.

---

[1] This total is lower than the figure given previously since it does not include the 600 tons of paper produced by the newly commissioned Ballarpur Mills during the closing weeks of 1953.

TABLE I

INDIAN PAPER MILLS 1953
PRODUCTION, CAPACITY, AND EMPLOYMENT AS MEASURES OF SIZE

Company Name	Production in Tons 1953(a)	Capacity Est. Dec. 1953(b) Tons	Employment Est. Av. 1953(b)
Andhra Paper Mills	1,500	2,000	500
Ballarpur Paper and Strawboard Mills	600	7,500	600
Bengal Paper Mill Co	10,400	14,000	1,500
Cauvery Valley Paper Mills (c)	500	1,000	200
Deccan Paper Mills Co (c)	3,500	4,000	500
Gujarat Paper Mills (c)	1,700(d)	2,000	700
India Paper Pulp Co	6,300	6,500	1,000
Mysore Paper Mills	3,800	4,000	1,100
National Newsprint Mills (Newsprint only)	Expected to Produce 27,000 tons in 1955		
Orient Paper Mills	29,500	31,000	1,900
Pudumjee Paper Mills (c)	900	1,200	100
Punalur Paper Mills	4,600	6,000	1,100
Rohtas Industries Ltd (Production mostly paper boards)	12,700	16,000	1,400
Shree Gopal Paper Mills	13,000	15,000	1,700
Sirpur Paper Mills	5,800	6,500	2,200
Star Paper Mills	5,000	5,500	800
Titaghur Paper Mills (2 mills)	35,000 (est.)	41,000	6,100
Tribeni Tissues (Cigarette paper only)	1,600	2,500	300
Upper India Couper Paper Mills	2,300	3,000	500
Total	138,700	167,700	22,200

a) Source: Planning Commission, Government of India, April 1954.
b) My own figures based on mill visits.
c) These companies do not have their own pulp mills.
d) This figure is for manufacture of paper only. This mill also made 4,200 tons of boards in 1953.

The fact that output was about 17 per cent below capacity is not attributable solely to labor troubles. The capacity figures, it will be noted, are for December and reflect the fact that expansion and speeding up of paper making equipment had been taking place during the year. Examples of this are the Ballarpur Mills which only began production in late November and the Rohtas unit whose output potential had expanded more than 25 per cent over its 1952 total. The capacity figures in Table I are based on data obtained directly from the firms. They fall between those of the Ministry of Commerce and Industry, as recorded in its monthly bulletins,[1] and those made available to the writer by the Planning Commission.[2] The former figures indicate a potential of 159,000 tons as of January, 1954 while the latter show an estimate of 173,000 tons for the same date. It should, perhaps, be pointed out that capacity figures are mere estimates subject to errors of judgment and that, especially during periods of growth, they cannot be relied on as giving exact information.

The third measure of mill size given in the table, that of employment, pertains only to the work force and does not include supervisory or head office personnel. It shows that the paper mills had on their permanent rolls in 1953 slightly more than 22,000 workers,

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1. Government of India, Ministry of Commerce and Industry, Monthly Statistics of the Production of Selected Industries, January, 1954, p. 16.

2. Government of India, Planning Commission. Unpublished review of the progress of the paper and paper board industry. Made available to the writer in April, 1954.

or a mean average of 1170 per unit. It does not show the far larger number of persons who worked in the mills as contract or casual labor or who toiled in the jungles on the procurement of raw materials. Unfortunately, this latter total has never been tabulated. Two other measures of size which were not included in the table due to their current unavailability on a mill basis were the 1953 figures for values of output and of net productive capital.[1] A fairly accurate estimate can be made for the first of these, but only an educated guess can be given for the second. The figure for mill value of production for the 1952-1953 financial year has been calculated at 187 million rupees while the total paper mill capital associated with this production was probably about 250 million rupees.[2]

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1. In expressing monetary valuations, a compromise between Indian and Western notations will be used in this paper. Monetary figures will generally be expressed in rupees, but the Western convention of using thousands and millions will replace the Indian vocabulary of lakhs and crores (100,000 and 10,000,000 respectively). Indian readers will note that numerical punctuation has been altered to fit the Western pattern.

For purposes of converting rupee figures into their dollar equivalents, the official rate since September, 1949, has been 4.76 or approximately five rupees to the dollar. From 1940 to 1949 the rate stood at 3.32-33, or almost exactly three rupees per dollar. The sterling rate has long stood at one shilling sixpence per rupee, or 13.33 rupees to the pound.

2. Value of production was calculated by totaling the sales (from profit and loss statements) for the 1952-1953 financial year of twelve mills which accounted for 83 per cent of physical production. To this figure of 153 million rupees was added 34 million rupees to cover the balance of the mills. The latter figure was obtained by multiplying output times estimated average realization per ton for each of the six units not included in the earlier total, and by summing these products. The 187 million rupee total is believed to be

As is the case in most large scale industries, the bulk of productive capacity in Indian paper manufacturing is concentrated among a minority of bigger firms. In 1953, the output of the largest concern (The Titaghur Paper Mills Limited) constituted 25 per cent of the industry total, and that of the second largest firm (The Orient Paper Mills Limited) made up 21 per cent. In the same year, the five biggest concerns produced 72.5 per cent of the year's output as contrasted with 4.5 per cent produced by the five smallest units. At the present time, fairly rapid changes are taking place in the respective shares of total output enjoyed by each firm so that by 1956 there will be not two, but six or seven concerns with outputs of 15,000 tons or more per year.

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applicable to the 1953 calendar year as well as to the 1952-1953 financial year since, (a) prices and production were relatively unchanged from 1952 to 1953, and (b) the mills held only small inventories of finished goods.

The Planning Commission estimated the total of fixed and working capital invested in the paper industry in 1950-1951 as being 218 million rupees. Programmes of Industrial Development 1951-1956, op. cit., p. 172. If this estimate is raised by 20 per cent, in proportion to the increase in paper output from 1950-1951 to 1952-1953, a capital figure of 262 million rupees is obtained. By an alternative method of appraisal, the ratio of total assets to output, which has been calculated from company figures for 83 per cent of the industry in terms of 1953 production, can be extended to include the other 17 per cent. If this method is followed, the figure for productive capital is 242 million rupees. In view of heavy capital expenditures which are known to have taken place in three mills in the 17 per cent group, a figure of 250 million rupees would seem to be a more accurate representation of the net amount of productive capital.

Data on the new Ballarpur and Nepa Mills have been excluded from the above calculations. The capital investment in these two new units had exceeded 65 million rupees by the end of 1953.

The most recent figures which show the relative sizes and rankings of industrial groupings in India are those of the 1948 Census of Manufactures.[1] In the five years between 1948 and 1953 a large-scale expansion has taken place in Indian industry rendering the numerical totals of the earlier year quite obsolete. These figures remain useful, however, for the orders of magnitude and rank within the industrial sector which they indicate, despite the further qualification that they do not include information on mills in Hyderabad, Mysore, and Vindhya Pradesh States which were not parts of former British India.[2]

The census figures show that in 1948 the paper industry had fixed capital valued at Rs. 53,700,000 and total productive capital worth Rs. 82,000,000.[3] On the basis of fixed capital investment it ranked ninth among the twenty-nine industrial groups for which data were given, with 2.7 per cent of the total. In terms of total productive capital its rank was eleventh and its share 1.7 per cent. The figure for value added by manufacture was Rs. 36,900,000 and for employment was 20,400, or 1.4 per cent of the industrial work force. By each of these last two measurements, paper making ranked eleventh in the manufacturing population.[1] Needless to say, differing rates of growth in the past five years coupled with changes in the system of industrial classifications may have altered the ranking of the pulp and paper industry. However, it seems likely in view of its fairly steady growth that the paper industry has raised rather than diminished, in every measure except employment, its relative standing in the manufacturing hierarchy.

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[1] Government of India, Ministry of Commerce and Industry, Third Census of Manufactures 1948, Vol. I.

[2] This excludes the Mysore and Sirpur Paper Mills which together contributed 6,000 tons or 6.5 per cent of the 1947-1948 industry output of 98,000 tons.

[3] Census of Manufactures 1948, op. cit., pp. 26-29. Some idea of industrial magnitudes is given by the following 1948 valuations of fixed capital by industrial groupings. Cotton Textiles, 487 million rupees; Iron and Steel, 247 million rupees; Jute, 229 million rupees; Engineering, 196 million rupees; Sugar, 158 million rupees; Vegetable Oils, 144 million rupees; Chemicals, 95 million rupees; Aluminum, Copper and Brass, 56 million rupees.

Viewed in its relationship to world pulp and paper manufacturing the Indian industry looks rather small. Indian output of 132 thousand tons for 1951 may be compared with production totals for the same year of 23 million tons for the U.S.A., 2.7 million tons for the United Kingdom, 2 million tons for West Germany, and 1.2 million tons for Japan.[2] A fairer picture of India's position as a paper producer is revealed by statistics on national outputs of printing and writing papers (excluding newsprint) since such papers account for about two-thirds of Indian production. In this more limited output category

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[1] Ibid., pp. 40 and 92.

[2] Food and Agriculture Organization of the United Nations, Yearbook of Forest Products Statistics 1952, Rome: 1952, p. 95. Hereinafter the Food and Agriculture Organization of the United Nations will be referred to as FAO.

India's one per cent of the total ranked her twelfth among the nations of the free world in 1950 and placed her second only to Japan among producing countries outside of Europe and North America.[1]

The Indian industry differs from established paper mills throughout the world in its use of bamboo as a primary raw material. Bamboo is also the source of fiber for the newly constructed paper mill in East Pakistan, but outside of the Indian subcontinent, primary paper making raw materials are mostly derived from the world's great forests of coniferous softwoods. The conifers account for 85 to 90 per cent of all paper pulp production. The remainder is divided between broadleaved woods, straw, sugarcane bagasse, certain varieties of grasses (including bamboo), rags, and, for special purposes, fibrous materials like flax, hemp and jute.[2] India's lack of accessible softwood forest resources has been a major obstacle to the growth of her paper making capacity as well as the one great deterrent to the development of domestic newsprint manufacture.

Before turning in the next chapter to an examination of the paper manufacturing process, a summary review of background data having a direct bearing on over-all industrial development will be interjected. Such a summary can by no means substitute for a general understanding of the Indian cultural and economic environment, but it may serve as a useful reminder of some of the factors which cannot be overlooked by one who is studying the growth of an industry.

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[1] United Nations Educational, Scientific and Cultural Organization, Paper for Printing Today and Tomorrow, Paris: 1952, p. 54. Hereinafter the United Nations Educational, Scientific and Cultural Organization will be referred to as UNESCO.

[2] FAO, Raw Materials for More Paper, Rome: 1953, pp. 3-7.

As a geographic unit, India is a huge peninsula extending southward over a span of twenty-seven degrees of latitude from the Himalayan Mountains to a point only eight degrees north of the Equator. It has an area of 1,200,000 square miles, which is roughly two-fifths of that of the United States. Within this area are to be found a wide variety of topography, climate, and resources. About 35 per cent of the land is under cultivation, 20 to 25 per cent more is temporarily fallow or is waste land which could be farmed, and 15 per cent is forest land. The remaining 25 to 30 per cent is covered by deserts or mountain ranges.[1] The chief topographic features are the massive Himalayan ranges, the northwestern deserts, the relatively dry central plateau, and the fertile areas which spread as broad borders to the major rivers and as narrow margins along the ocean boundaries. In the southern part of the country the climate is mostly tropical and humid, while in the north and on the arid central plateau, the temperatures range from means of fifty degrees or less in winter to debilitating extremes of 110 to 120 degrees in April, May, and June. Rainfall for most of the country pours down during the southwest monsoon which lasts from June to September or October. This is supplemented, in southeastern India only, by a second monsoon during the early winter months. Periodic failures of the monsoons not only spell disaster to those dependent on them for agricultural crops but may also seriously curtail industrial activity by eliminating sources of water and power and by impoverishing the market in which manufactured goods must be sold.

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[1] United States Department of Commerce, Office of International Trade, Investment in India, Washington: U.S. Government Printing Office, 1953, p. 8.

India's natural resources are somewhat more plentiful than is often supposed. Water power potential has been estimated as in excess of 40,000,000 kw., coal reserves are figured at twenty billion tons, and high grade iron ore reserves are believed to approach ten billion tons.[1] These key resources tend to be concentrated in a few geographic areas. More than 80 per cent of the country's coal and iron are produced in the states of Bihar and West Bengal while much unharnessed water power is located in the relatively inaccessible Himalayan regions. According to 1953 figures, India ranked fifth among the nations of the world in coal production and tenth in pig iron output.[2] Other important minerals to be found in generous supply are mica, manganese, bauxite, titanium, chrome, and gypsum. To date, very little oil has been found within Indian boundaries, but it is clear that the country possesses the major physical requisites for large-scale industrial development.

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1. Ibid., pp. 73-75.

2. New York Times, January 5, 1954, p. 50.

Inhabiting the Indian subcontinent is a population which numbered 360 million in 1951. Of this total 83 per cent lives in rural areas while some sixty-two million are considered urban dwellers. The rate of population growth is close to that of the United States, being a little more than 1 per cent per year. Life expectancy and mortality rates of the two nations exhibit no such similarity. For India, life expectancy is about thirty-two years and the death rate is still very high, although only one-half of what it was in the first decades of this century. The incidence of malaria has been estimated at 100 million cases annually with a death rate of one to one and a half million. Tuberculosis is believed to take an annual toll of an additional half a million, with cholera, smallpox, and plague each accounting for tens of thousands more.[1] Working in consort with these dread diseases are malnutrition, food adulteration, and pollution of water supplies, the effect of which, if not to kill, is certainly to weaken and debilitate large numbers of the populace. Needless to say, a high incidence of sickness is a relentless opponent to increased national output and productive effort.

The Indian population is not a homogeneous one, being compartmentalized by geography, language, religion, and caste, yet it exhibits marked cultural and increasing political unity. There are more than 200 separate tongues spoken within the country's borders with extensive usage being given to a dozen of them. Hindi is spoken or understood by one-quarter of the people but it is still a strange tongue to South India. English, which is still the official language of government publications and business transactions, is spoken by only a few million people, although this minority includes almost all business, educational, and government leaders. Hindustani, a modified version of Hindi, is scheduled to become the nation's official language in 1965, a change which, if carried through, is bound to affect both industrial progress and the future demand for paper.

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[1] Owen, Rowland, India-September, 1952, Overseas Economic Survey, London: H. M. Stationery Office, 1953, pp. 132-133.

The literacy rate for the whole nation is less than 20 per cent despite impressive efforts which have been made in recent years to increase it. The distribution of education has for many years resembled the apportionment of riches. People have either had a great deal of formal education or none at all. The correction of this maldistribution of scholastic training will take longer to implement than the reallocation of tangible wealth. The major result of the present imbalances of schooling is the coexistence of an underemployed and dissatisfied intelligentsia and an untrained, superstitious, and intellectually dormant mass.

Religiously, India is a Hindu country, but minorities numbering 43,000,000 Moslems, 5-6,000,000 Christians, 4-5,000,000 Sikhs, and significant groups of Jews, Jains, and Parsees also inhabit the country.[1] The culture of the country is predominantly Hindu, but the influences of Mohammedanism, Buddhism, and Christianity have also helped to shape the habits and traditions of the people. The stratification of the Hindu population into communities, castes, and subcastes is a cultural and economic reality which has a powerful influence on popular attitudes and modes of behavior. In rural areas and in matters concerning domestic life, caste continues to play a dominant but probably declining role. In urban areas, in government, in industry, and in commerce it exerts far less influence. The one exception to this trend is the status of the _harijans_ or untouchables, whose position, while improved, still remains apart and clearly inferior to that of the rest of the people, despite provisions in the National Constitution banning discrimination on a caste basis.

The slow disintegration of the caste system is but one symptom of changes which are taking place in social and cultural values. These changes are being brought about as the result of sheer economic necessity combined with a rapidly growing social and political awareness on the part of the people and their leaders. Present day thinking in India is affected by such varied influences as the life and teachings of Mahatma Gandhi, Western liberal thought, ancient Hindu scriptures, anti-Colonialism, antiracialism, and a desire to achieve economic progress. The last of these influences causes many Indians to look with interest and admiration at the accomplishments of the Soviet Union in the field of economic development.

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[1] _Investment in India_, _op. cit._, p. 14.

Among the many historical events which have altered the course of Indian life, two in particular have great relevance to any study of the present day situation in the country. They are the final achievement of independence from Britain in August, 1947 and the partition of the country which immediately followed it. Independence, by itself, involved many difficult adjustments and the assumption of large responsibilities by relatively inexperienced men, while partition added a tragic record of carnage, destruction, and irrational bitterness to the situation. Since independence, India has developed a stable, democratic government, and has attempted to heal some of the worst wounds resulting from partition. Still unresolved, however, are many of the costly economic consequences of the divorce of Pakistan from the rest of India.

With Pakistan now a completely separate political entity, the Indian Union, as presently constituted, is a federation of twenty-seven separate states divided into three classes in accordance with the respective degrees to which they enjoy self-government. Although there is a constitutional separation of powers between the federal and state governments as in the U.S.A., the Central Government in New Delhi has more far-reaching legislative and administrative powers than does its Washington counterpart. Some applications of these broad government powers to industrial activities will be considered later in this study.

The political party which has held the administrative reins of government since the departure of the British has been the Indian National Congress under the leadership of Prime Minister Jawaharlal Nehru. Although the Congress obtained only about 43 per cent of the votes cast in the elections of 1951-1952, it achieved a strong majority in the Central Parliament and sufficient seats in all state legislatures but one to form ministries. Its opposition has been made up of many separate elements the largest of which are the Praja-Socialist Party (composed of Socialists and Gandhian dissenters from the Congress) and the Communist Party. In the 1951-1952 elections the Socialists and Gandhians together polled about 16 per cent of the vote while the Communists and their allies received 5 per cent.[1]

Despite the defection of a minority of Gandhian purists the Congress retains wide popular support because it is considered the party of Mahatma Gandhi and the historic leader in the fight for independence. Like the Democratic Party in America, it has within its membership a wide variety of economic and political interests, from those of social reformers and labor leaders to those of professional politicians, businessmen, and landholding representatives. Party policies, which had a utopian socialist flavor in 1945, have tended to become more conservative with passing years. The Congress, however, is still committed to the nationalization of key industries, to continuing land reforms, and to extensive welfare legislation, although its chief concern is with economic development as embodied in the current Five Year Plan.

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[1] Investment in India, op. cit., p. 16.

The Plan was initiated in April, 1951 on the basis of recommendations submitted by the Planning Commission which had been established a year earlier. It calls for an outlay over the five year period ending in March, 1956 of slightly less than twenty-one billion rupees.[1] This outlay is aimed at initiating a process of development which will ". . . raise living standards and open out to the people new opportunities for a richer and more varied life."[2]

The allocation of the proposed funds is shown below in summary form:[3]

Categories	Outlay 1951-1956 (in billions of rupees)	Percentages of Total Outlay
Agriculture and Community Development........	3.60	17.4%
Irrigation and Power.....	5.61	27.2
Transport and Communications..............	4.97	24.0
Industry.................	1.73	8.4
Social Services..........	3.40	16.6
Rehabilitation...........	.85	4.1
Miscellaneous............	.52	2.5
TOTAL	20.69	100.0

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[1] Billion is used here to mean one thousand million.

[2] Government of India, Planning Commission, Progress of the Plan, New Delhi: Government of India Press, 1954, p. 1.

[3] Government of India, Planning Commission, The First Five Year Plan - A Summary, New Delhi: 1952, p. v.

Included in the allocation for agriculture and community development is the sum of 150 million rupees for encouragement of cottage and small-scale industries. This provision by the Central Government is to be supplemented by a further 120 million rupees from state sources.[1] Among the ten village industries for which programs of development have been worked out under the Plan, is the production of handmade paper. The outlook for a revival of this moribund industry will be discussed in the following chapter. At the present time the volume of paper produced by hand methods amounts to a very small fraction of one per cent of the output of the Indian paper industry.

It will be noted that more than one-half of the total outlay of the Five Year Plan has been earmarked for the development of public utilities including irrigation. Although the extension of public power generation will certainly benefit a portion of the paper industry, it is the projected improvement in the transportation and communication situation which will be of the most vital importance to the growth of this industry. The large land mass of India, coupled with the fewness of all-weather roads and of navigable inland waterways, makes the country heavily dependent on her rail network to tie together her scattered towns and cities. The government-operated railways form one of the world's largest rail systems, yet under present conditions they are unable to meet the demands being made on them. Among the major causes of current bottlenecks in rail transportation are acute shortages of rolling stock, the absence of certain key track linkages, and the coexistence of three separate networks with different gauges of track.

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[1] Ibid., p. 83.

The relatively small 8.4 per cent of scheduled expenditures allocated to industrial development under the Plan is evidence of the Government's decision to assign this field of investment largely to private enterprise. The latter has not been left free to choose either the course or the rate of its development, however, but has been made subject to far-reaching government controls under the Industries (Development and Regulation) Act, 1951.[1] A discussion of the nature and of the implications of these controls will be found in Chapter 5. Meanwhile it will merely be noted that paper making in India is largely a private enterprise industry operating within a framework of regulations, licensing provisions, and subsidies established by a relatively paternalistic government.

The progress of the schemes envisioned by the Planning Commission was relatively slow during the first two years of the Plan's operation. Approximately 5.85 billion rupees were spent during this period, leaving more than 70 per cent of the proposed development outlay to be incurred in the three years remaining.[2] Schemes which had been started before the advent of the Plan came to fruition during this time, but most of the projects initiated within the five year program had not shown appreciable returns by mid-1953. Nonetheless, it is expected that, with the foundations for growth having been laid during 1951 and 1952, development will proceed at an accelerated rate from 1953 onwards. This would appear to hold true for the paper industry as well as for the rest of the economy.

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[1] Government of India, Ministry of Law, The Industries (Development and Regulation) Act, 1951 (55 of 1951), (as modified up to the 1st June, 1953), Delhi: Manager of Publications, 1953.

[2] Government of India, Planning Commission, Five Year Plan Progress Report for 1951-1952 and 1952-1953, New Delhi: May, 1953, p. 1.

With this chapter of background information as its foundation, this report will now turn to a more detailed study of the economics of the growth of the paper industry beginning with a discussion of the manufacturing process.

CHAPTER 2

Manufacturing Methods and Equipment

The making of paper consists essentially of reducing some suitable vegetable matter to a watery pulp, treating that pulp to give it certain desired properties, and forming it into thin sheets which are dried, pressed, and trimmed to size. From a technical standpoint, these operations can be performed in primitive village industries, in small manufacturing units, or in large, complex, and capital intensive mills. The pulp making and the paper making operations may be carried on separately or together in integrated units. The process may be a long and elaborate one or it may simply involve the reworking of waste paper into some low grade paper product. Differences in raw materials, in technical processes, in degrees of mill integration, and in final products provide for many variations in paper making and sometimes make comparison and generalization difficult. On the other hand, common patterns in the use and processing of materials and in the production of fairly standardized products do emerge in geographic regions and in sectors of the industry.

More than 95 per cent of the world's supply of paper pulp is made by one of five methods. Three of these methods, the soda, sulfite, and sulfate processes involve the treatment of fibrous raw materials with strong solutions of chemicals and yield what are known as chemical pulps. A fourth method is based on the grinding up of certain woody materials to give mechanical or groundwood pulp, and a fifth procedure, relatively new, includes a combination of chemical and mechanical methods to yield semi-chemical pulp. Almost all of the paper pulp made in India is a product either of the soda process or of a modified version of the sulfate method called the semi-sulfate process. The former is used in pulping grasses while the latter is employed in breaking down bamboo.[1] The sulfite method, which is widely used for the pulping of softwoods in Europe and North America, is utilized (to make bamboo pulp) by only a single relatively small Indian mill, the India Paper Pulp Company, Limited. The groundwood process, which is the key to the production of cheap newsprint, is not yet employed extensively but will become important when the National Newsprint Mill goes into operation. The semi-chemical process has yet to find its way to India. The preparation of rags, hosiery cuttings, cotton waste, and the like for paper making is performed by cooking them in a weak caustic solution and does not entail any of the pulping methods mentioned above.

Although this study is primarily economic and nontechnical in nature, it has seemed desirable to sketch in a certain minimum of technological information in order to give meaning and perspective to subsequent discussion. For this reason, a summary description of pulping and paper making methods in the semi-sulfate, groundwood, and handmade processes are interjected here, and a diagram of the first of these methods is given in Fig. 2.

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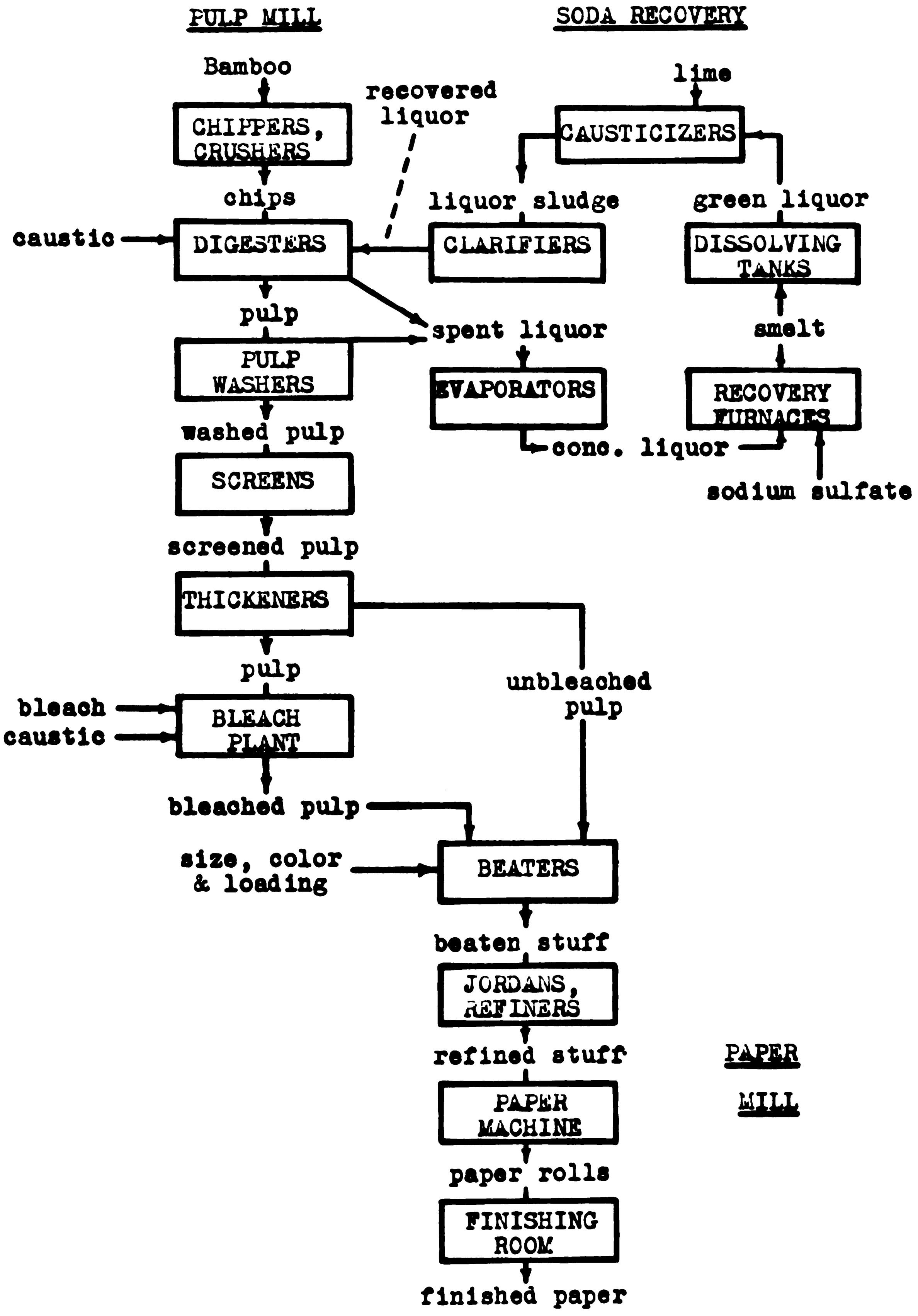
1. Technically bamboo is a grass, but in this report, as in the Indian paper business, grass is used in its narrower sense and does not include the bamboos.

FIG. 2 DIAGRAM OF THE SEMI-SULFATE PROCESS



The making of pulp by the semi-sulfate process begins with the fragmentation of the raw material (bamboo) in high speed mechanical chippers or by means of massive crushers similar to those used in sugar mills. The chips are conveyed to the top of what is known as the digester house where they are loaded into large pressure cookers, or digesters, and cooked with a strong solution of caustic soda (sodium hydroxide) and sodium sulfide for a number of hours. In the course of digestion, the lignous material which comprises about 50 per cent of the content of the bamboo is dissolved in the alkaline solution and is thus separated from the cellulosic fibers which are to be used in the paper making. On completion of the cooking, the spent chemical liquor is drawn off and the residual fibrous pulp is subjected to a series of washings, screenings, and thickenings. If it is to be used for better grades of writing or printing papers, the pulp is then bleached to the desired degree of whiteness, using liquid chlorine or a bleaching solution of chlorinated lime. The bleaching state is completed by the neutralization and rewashing of the pulp preparatory to the paper making process. Pulps which are to be used in making board fillers, wrappers, and other low grade papers do not undergo the relatively expensive bleaching operation.[1]

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[1] This process is considered in more detail in Bhargava, M. P., "Pulp Production in India - A Commentary," Indian Pulp and Paper, July, 1952, pp. 32-34; and Kothari, P. S., "Bamboo Paper and the Market," Indian Pulp and Paper, July, 1952, pp. 97-103.

The equipment required for this process is bulky, costly, and once installed, is not easily moved. Each stage of the process permits alternatives in type and design of equipment employed, the choice depending both on the date of installation and on the nationality of the mill designer.[1] Similarly, between stages, there are alternative choices in the means of handling and conveying materials. The selection of these latter methods is influenced by relative costs of labor and capital as well as by factors of time and designer's preference.

The spent liquor from the digestion process is too valuable for its chemical content and too potent an agent of river pollution to be discarded. Except in the smallest scale operations, therefore, this liquor is sent to a chemical recovery unit where it is first concentrated in multi-stage evaporators and then burned in a furnace. The burning process carbonizes the lignin which the liquor had dissolved from the bamboo leaving a residue composed of sodium carbonate, sodium sulfate, and carbon, known as black ash. Additional quantities of sodium sulfate (salt cake) are added to the black ash to make up for process losses, and the mixture is then smelted. In the course of the smelting the sodium sulfate is reduced to sodium sulfide and the carbon is driven off as carbon dioxide gas. The final steps in the recovery process consist of dissolving the smelt in water,

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1. Almost all of the pulp and paper mill equipment is imported, most of it from Europe. Paper makers of different countries tend to show diverse preferences in the choice of methods and equipment for such operations as the washing, screening, and bleaching of the pulp.

causticizing it with lime (to reconvert the sodium carbonate to caustic soda) and clarifying the revitalized liquor, thus completing the cycle.[1]

The following points may be noted with respect to the economics of chemical recovery. In the first place, the process makes possible a continuous renewal of relatively expensive caustic soda and sodium sulfide through inputs of the considerably cheaper chemicals, lime and sodium sulfate. In the second place, the degree of recovery, and consequently the efficiency in the use of chemical resources, is invariably higher in large, modern units than it is in smaller and older ones. Very small plants and handmaking units cannot afford the investment necessary for a recovery system and must therefore use new chemicals each time. Mills of 8,000 tons annual output or less can usually justify only relatively crude rotary furnace units capable of recovering only 60-70 per cent of pulping chemicals. By contrast, pulp mills with capacities of 15,000 tons or more per year can scarcely afford to be without a so-called Tomlinson furnace in combination with modern causticizing equipment which together permit re-use of better than 90 per cent of chemical inputs. Mills of 8,000-15,000 ton capacities fall in an intermediate zone in which it cannot be stated unequivocally whether investment in high cost recovery equipment is economically wise.

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[1] Since there are always some chemical losses in the soda recovery process, it is necessary to make periodic additions of fresh caustic to the cooking liquor to maintain its strength.

The Tomlinson furnace and its somewhat similar small brother, the Wagner furnace, both yield economies in heat conservation as well as in chemical recovery. The heat of combustion of the black liquor which is mostly wasted when rotary furnaces and crude smelters are employed, is used for steam raising purposes in the Tomlinson and and Wagner units. The latter furnace is not so efficient as the Tomlinson but is more adaptable to medium scale operations. Both of these furnaces, as well as the Dorr-Oliver causticizing equipment which is normally linked with them, are American developments of the last twenty years which were unknown in India until very recently.

One further economy in the recovery of chemicals which is achievable only with a large-scale operation pertains to the trapping of chemicals otherwise lost in the exhaust smoke from the recovery furnaces. This can be accomplished by the use of percipitators which, being very expensive, are never found in small mills and are not used as often as they might be in the larger Indian units.

Turning now to the actual making of the paper, this process begins with the transfer of the pulp to the paper mill. In an integrated plant, the wet pulp stock is merely piped from one section to another, but where pulp and paper mills are separate units, the extra expenses of forming the pulp into sheets, drying, packaging, and handling it are involved. The conversion of raw pulp into the finished stuff from which paper is made requires heavy inputs of power to machines called beaters, Jordans, and refiners, which brush and split the cellulose fibers. The beaten stock, with additions of loading, sizing,[1] and coloring is then sent to the paper machine where it is formed into a sheet, dried, pressed, and rolled up into large reels. The paper machine (or Fourdrinier)[2] is massive, expensive, and long lived. It is a heavy consumer of power, of steam, and of elements of equipment known as machine clothing. These latter consist of flexible bronze screens called wires and huge woolen blankets called felts. They are replaced at intervals of approximately four and six weeks respectively and must all be imported from abroad.[3] The sizes and speeds of paper machines depend in part on their dates of manufacture and in part on the type of paper being made. International practice calls for high speed machines to make cheap papers and for slower equipment to produce the higher grades for printing and writing.

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[1] Loading consists of some inert powder, usually china clay, which fills the pores of the paper and helps to give it a smooth surface. Sizing is generally made up of rosin and alum. Its function is to reduce the absorbency of the paper and give it added stiffness.

[2] The Fourdrinier is not the only type of paper machine although it is by far the most widely used one. Certain kinds of paper and most paperboard are made on so-called cylinder machines which differ from the Fourdrinier chiefly in their use of rotating cylinders instead of a wire screen for forming the paper sheet.

[3] It is unlikely that machine clothing can be made economically in India until the paper industry reaches many times its current size. At the present time, economies of specialization permit felts made in the United Kingdom from Australian wool virtually to monopolize the Indian market.

The final or finishing stage of paper making consists of cutting the paper to size, inspecting, counting, and packaging it in reams or rolls. Some mills go one step further and convert the finished product into notebooks and other stationery. Unlike the principal stages of pulp and paper making, the finishing process is highly labor intensive. It is the only aspect of paper manufacture in which piecework is substituted for hourly wages in the remuneration of workers.

Requisite to almost all of the preceding stages are large inputs of fresh water, steam, and power. No efficient, modern mill can afford to be without adequate water purification and pumping equipment or a local source of power and steam. On account of its large consumption of relatively low pressure steam for process purposes, a paper mill may realize distinct economies in the generation of electric power. This is because it is able to re-use the exhaust steam from high pressure turbo-generators and thus recover much heat which would otherwise be wasted. It is claimed that the cost of generating electricity as a joint product with process steam in a properly designed paper mill power plant will normally be lower than the power generation costs of public utilities, including hydroelectric schemes.[1] This cost advantage is lost on the majority of Indian paper plants whose generating units are not designed for their needs and whose boilers are often old and inefficient. More than one-half of the firms purchase some public power, and three of the smaller concerns depend entirely on external supplies of electricity. By contrast, two of the newer and larger mills make surplus power which they sell to neighboring factories. The point to be remembered with respect to all of these inputs is that making provision for them adds significantly to the capital investment tied up in a modern integrated mill.[1]

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[1] Börger, H. E. A., "Steam Pressures and Temperatures in Modern Paper Mills," Indian Pulp and Paper, January, 1954, p. 34.

While paper making is a relatively capital intensive industry, it is not one which allows capital equipment to remain long idle. Mills in India are operated on a continuous, three shift basis, seven days per week in most cases. The usual practice is to shut down one day each fortnight for routine maintenance and cleaning, and to halt operations for about two weeks per year for major overhauls. This means that about 10 per cent of potential production is given over to maintenance. Further decrements of production time are attributable to frequent changes of grade and specifications of the papers being made. The extent of such losses varies considerably from mill

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1. Other installations which increase the amount of capital investment in paper mills are facilities for the preparation of chemicals. Six firms have their own electrolytic plants for producing caustic and chlorine and at least that many mills also have lime burning facilities.

Two concerns, Shree Gopal Mills and Rohtas Industries combine paper making with several other activities. At Shree Gopal, stationery making and the hydrogenation of vegetable oils are associated with the paper mill, while at Rohtas the crushing of sugar, the making of cement, the production of paper, and the synthesis of chemicals all take place within one large factory unit.

to mill, but it is believed that in some firms they may be as high as 4 per cent of machine time.

The maintenance and repair of all of the pieces of capital equipment mentioned above devolves upon the engineering departments of each of the mills. These departments are forced to become fabricators of many of their own replacement parts, owing to the distance of the paper mills from foreign suppliers and to the absence of industrial service organizations in India. Each concern, therefore, maintains its own foundry, smithy, and workshops, and each employs craftsmen to make parts which the market cannot readily supply. Consequences of this enforced self-sufficiency are losses of the economic advantages of specialization, increases in overhead costs, and impairment of the quality of the replacement parts utilized.

The foregoing generalized statements about pulp and paper production have referred primarily to mills making paper from bamboo by the semisulfate process. With a few modifications they would also apply to the other processes by which chemical pulps and papers are made in India. The manufacture of mechanical pulp involves somewhat different technological and economic considerations. It is made by shredding softwood logs against large rotating grindstones liberally sprayed with water. The resulting groundwood pulp is weak and subject to early discoloration, but when mixed with 15 to 30 per cent of chemical pulp, it yields a product essential to the modern world, namely newsprint.

The one unique advantage of mechanical pulp is its relative cheapness as compared with all other pulps. This cheapness stems from the elimination of costly chemical treatment and from an approximate doubling of the pulp yields obtainable through any of the chemical processes. Since a newsprint plant must use chemical as well as mechanical pulps, its processes include those described for semisulfate as well as for groundwood pulping. A further distinguishing characteristic of newsprint production is its requirement of large volume, high speed equipment, lacking which it ceases to be economical.

At the opposite extreme from newsprint manufacture in terms of methods of production, is the handmade paper industry.[1] For purposes of discussion, two classes of hand paper making must be distinguished from one another. The first of these consists of the production from pure rag stock of especially high grade document, money, or imitation parchment papers for very small and specialized markets. The second consists of the manufacture by crude and ancient procedures of commercial type papers using locally available raw materials. The former category of paper making still exists to a limited extent in Great Britain and on the European Continent since it produces papers which cannot be matched by machines. The latter type was made obsolete by the Industrial Revolution but still survives feebly in a few countries. Attempts are being made in India to re-establish both of these manual production methods as parts of the village industries development schemes of the Five Year Plan. A number of alternative approaches have been suggested which combine traditional methods with some recent innovations. Most of these proposals however involve a considerable element of government subsidy, low remuneration to labor, and inefficient use of chemicals, fuel, and capital investment. They are advocated as means of alleviating rural unemployment but they are acknowledged to require much larger initial investments per unit of output than any other type of village industry.[1] In India, as elsewhere in the world, handmade cannot compete with the mill made product. It can only survive in the very limited market for superior papers, and even here it must be able to meet the competition of top quality imports from Europe.

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[1] Data on handmade paper were obtained chiefly from visits to the Handmade Paper Research Centre in Poona and the Sanganer village project of the Handmade Papermakers Cooperative Society, Rajasthan. The former organization has issued several very helpful bulletins analyzing the problems and costs of producing handmade paper.

The handmade industry is not alone in the paper making field in requiring government subsidy or in making inefficient use of resources. The same criticisms can be levelled against many of the smaller mills. A glance at Table I in Chapter 1 will show that most production units in India are of modest proportions--thirteen out of twenty of them having outputs of less than 10,000 tons per year in 1953. From an economic point of view, small size is a distinct handicap to an integrated pulp and paper mill due to the many economies of scale inherent in both pulp and paper production. The most significant saving which attaches to large-scale operation is that of combined heat and chemical recovery through the use of the Tomlinson furnace. Opinions differ as to how much annual production is required to justify installation of such a furnace but most estimates place the figure above a 15,000 ton minimum. The slightly less economical Wagner furnace can be employed in mills with outputs as low as 10,000 tons per year. Other production economies do not show such lumpiness but make themselves felt in many ways as mills increase in size. Such savings accrue to bigger mills through diminished labor charges, reduced overheads, and decreased costs of equipment per unit of output. As a specific example of this last type of economy, one mill was quoted prices of Rs. 2,260,000 for a twenty-five ton (daily) capacity paper machine, and of Rs. 2,530,000, or 12 per cent more, for a unit with twice the output. Needless to say, the larger unit would not require an operating crew twice as large as the smaller machine, and it might even be run by the same number of men. Because the mills tend to carry fairly large indirect labor forces and to provide housing and other welfare benefits for their employees, expansion in output, especially if unaccompanied by increased direct employment, results in substantial savings in overhead costs.

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[1] Handmade Paper Research Centre, Unpublished bulletin entitled, "Possibilities and Limitations of 'Handmade Paper Industry' as a Cottage and Small-scale Industry," Poona: September, 1953, p. 1.

Although 15,000 tons is probably the minimum annual output for a low cost pulp mill, and consequently also for an integrated pulp and paper unit, the same minimum does not apply to the paper making operation itself. Firms of much smaller size which purchase their pulp and produce papers for specialized market demands function as economic units. The present economic environment in India does not favor the growth of small specialty firms since all domestically produced pulp is consumed by the integrated firms that make it, and imported pulp is currently very expensive. Since paper making potential in India has generally exceeded pulping capacity, the proposal of setting up a pulp mill without concomitant paper making facilities has often been advanced. At the present time, the market for pulp is probably neither large enough nor sufficiently concentrated to justify such a project. In addition, the relative levels of import duties, 18.9 per cent on pulp versus 39.4 per cent on most papers, give considerably more encouragement to the construction or expansion of fully integrated units than to the erection of pulp mills.[1]

Size of mill and size of production equipment are not necessarily proportionate, and small paper machines are to be found in almost all of the mills. Most of these machines were installed in the era before large, high speed units had been developed.[2] A number of them are rebuilt machines, bought second hand and installed since the war. These small, aging units continue to be used, with occasional reconditionings and overhauls. Their survival is attributable not only to their apparent indestructability but also to low wage rates, to the types of orders received, and to the high price of new equipment. With wage rates averaging from 5 to 7 per cent of what they are in America, labor savings will not pay for new machines in a short time. With paper orders characterized by short runs and frequent changes of specifications, the economies of mass production on high speed machines cannot be fully realized. Finally, with current costs of new machines being high, especially as compared with depreciated investment in old equipment, most paper firms are not in a hurry to replace that old equipment with its modern counterpart. Instead, they choose to retain the facilities they have and to add new units only as demand increases. Lack of competition for existing markets, and government paper prices pegged to cover costs of production by not-too-efficient methods make possible the continued use of this overage machinery.

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[1] Import duty figures were taken from Government of India, Department of Commercial Intelligence and Statistics, Indian Customs Tariff, July 1, 1953, p. 30.

[2] In 1953, there were forty-six paper machines in the twenty mills covered by this report. Two-thirds of these machines were more than twenty years old and one-third of them had been built before 1900. The number of new machines installed in the last decade amounts to only eight, despite the fact that paper making is one of India's more rapidly expanding industries.

While it is true that the paper industry operates with much old equipment, it is also true that several of the more progressive mills have either made large investments in new equipment since World War II or have so rebuilt their existing plants as to double capacity in the last ten years. The expansion of several of these firms will be examined in Chapter 9.

Like the processing facilities discussed above, the materials handling methods of the paper industry tend also to be somewhat outdated. No unqualified generalizations can be made in this regard, since all types and gradations of conveying, feeding, and unloading devices are to be found in the industry (and sometimes in a single mill). These materials handling procedures reflect a mixed ancestry of traditional Indian methods and modern Western techniques. The relative cheapness of manpower and the ubiquitous pressure to provide local jobs encourage the use of primitive and labor intensive systems, whereas the importation of equipment from lands where labor is far dearer has the very opposite result. Current wage rates and the demands of modern mill operations have made obsolete many traditional methods of materials movement without justifying the substitution of elaborate and costly Western devices. It may no longer be economical to move coal in baskets conveyed by the human head nor yet be justifiable to import an overhead crane to do the job. However, attempts to find compromise solutions to such technological dilemmas have not yet been widely undertaken, despite the pressing need for a half-way technology.

The mixture of labor intensive and of capital using methods is not confined to materials handling but extends all the way through plant operations. As between mills there are marked differences in the proportions in which these two factors are combined. In Table II, column 4, the amount of gross fixed investment per worker is shown for each of ten firms (eleven mills) which accounted for 79 per

TABLE II

INVESTMENT, OUTPUT, AND EMPLOYMENT RATIOS(a) FOR TEN INTEGRATED PAPER FIRMS IN 1953

Firm	Fixed Invest. Million Rupees (1)	Annual Output (1000 Tons) (2)	Average (b) Number Workers (3)	Invest. Per Worker (1000 Rs.) (4)=(1)÷(3) (4)	Output Per Worker Year (Tons) (5)=(2)÷(3) (5)	Invest. Per Ton Output (1000 Rs.) (6)=(1)÷(2) (6)
Orient	33.3	29.5	1900	17.5	15.5	1130
Titaghur (2 mills)	48.5	39.5(c)	6100	8.0	6.5	1230
Shree Gopal	10.8	13.0	1700	6.2	7.7	830
Bengal	19.8	12.5(c)	1500	13.2	8.3	1580
Ballarpur	18.8	7.5(d)	600	31.2	12.5	2510
I.P.P.	9.2	6.3	1000	9.2	6.3	1460
Star	5.0	5.0	800	6.3	6.2	1000
Punalur	5.7	4.6	1100	5.2	4.2	1240
Mysore	5.9	3.8	1100	5.3	3.5	1540
U.I.C.	2.6	2.3	500	5.2	4.6	1130
Ten Firms(e)	159.6	124.0	16,300	9.8	7.6	1290

(a) Fixed investment figures in column (1) are gross figures taken from the balance sheets of each of the firms for March or June of 1953. Output data were obtained from the Planning Commission, New Delhi, in April, 1954. Employment totals are based on information acquired through mill visits.

(b) Does not include supervisors, head office personnel, casual or contract labor.

(c) Estimate of what production would have been in the absence of labor disputes.

(d) This is a capacity figure, since mill had operated for only six weeks in 1953.

(e) The first three figures in this row are totals; the second three are weighted averages.

cent of the 1953 output of paper. Gross investment figures have been used, since depreciation policies of many of the firms are not consistent from year to year and bear little relation to the anticipated life of assets. Although the companies listed in the table are not a completely homogeneous group, they are similar enough for limited comparisons to be made.[1] All of these firms have integrated pulp and paper operations and all but two of them (Punalur and Orient) are primarily manufacturers of printing and writing papers.

It can be seen from column 4 that gross fixed investment per worker ranges from Rs. 5,200 to Rs. 31,200 with a mean of Rs. 9,800. The high figure is for a new mill built at a time of inflated costs and should probably be considered atypical. The second highest investment ratio is Rs. 17,500 per man which, although large by Indian standards, is still well below the equivalent figure in an American mill.[2]

As would be expected, there is a relatively close correspondence between investment per worker (column 4), and output per worker (as tabulated in column 5). The coefficient of rank correlation between these two ratios in the ten firms is .863. A comparably high coefficient of correlation (.795) is found to exist between size of firm measured in terms of output (column 2) and production per man (column 5 again). The close concordance which is observed between high worker productivity on the one hand and both large investment per man and above average company size on the other (all adjectives being used in the relative sense) obtains in somewhat lesser degree between size of firm (2) and investment per worker (4). The correlation between these last two columns turns out to have a rank coefficient of .652. By contrast to the distinct positive relationships indicated by these coefficients, no such correlation is to be found between capital-output ratios (shown in column 6) and size of firm, whether measured in terms of fixed assets (column 1) or of annual production (column 2). One cannot infer from the data available here that either the larger or the smaller firms employ greater amounts of capital per unit of output.

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[1] A number of the mills engage in stationery manufacturing and three of them (Titaghur, Shree Gopal, and Mysore) have their own electrolytic plants for producing caustic and chlorine. Increments to investment and employment totals attributable to these additional operations are not sufficiently large to effect significant changes in the correlations shown here.

[2] A study of gross investment in plant and equipment for seven coarse paper companies in the United States in 1950 showed an average investment of $10,700 (Rs. 51,000) per employee, with a range from $7,000 (Rs. 32,600) to $15,300 (Rs. 73,000). Mutual Security Agency and U.S. Department of Labor, Capital Requirements and Operating Ratios--The Coarse Paper Industry 1949 and 1950, prepared by Industrial Research Department, Wharton School of Finance and Commerce, University of Pennsylvania. Washington, D.C.: May, 1953, pp. 23-24.

Although paper manufacture in India requires larger investments per worker than do the jute or textile industries, for example, it is by no means as capital intensive as it might be. According to figures shown in the 1948 Census of Manufactures, paper making ranked tenth among the twenty-nine industrial groupings listed on the basis of capital-output ratios.[1] This position may be compared with that of the American pulp and paper industry which ranked third on a similar basis among twenty-two major manufacturing industries in 1947.[2] As suggested in the preceding pages, primitive labor-using methods are often employed in handling materials, and relatively large crews are required to operate low capacity equipment. Owing in part to the unavailability of instrument supply and maintenance services, automatic regulating devices have not yet displaced operators to any great extent. Other considerations which have encouraged the heavy and continued use of labor have been low standards of worker literacy and the debilitating effects of heat and disease operating in concert with an unrelenting public pressure on companies to provide jobs. One effect of the country's great unemployment problem has been to cause labor unions, the Government, and public opinion to oppose technological changes which would entail reductions in force, thus retarding the rationalization of many mills.

An aspect of the labor situation which still permits some flexibility of operations is the use of contract labor. A number of the mills hire contractors to perform all or part of their requirements for the unloading and piling of raw materials and fuel, the loading out of finished paper, and the disposal of waste product. By so doing they not only avoid carrying excess personnel for such purposes but they also save some of the difference between what the contractor pays his workers and what they would have to pay for the same amount of labor hours. The subcontracting of work in paper mills is generally confined to construction operations and to certain materials handling jobs and does not extend to the manufacturing process.

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[1] Census of Manufactures 1948, op. cit., Vol. I, p. 10.

[2] Creamer, Daniel, Capital and Output Trends in Manufacturing Industries, 1880-1948, (Occasional Paper 41), National Bureau of Economic Research, New York: 1954, p. 63.

A phase of production operations which is not at present handled effectively by the mills and which might be dealt with successfully on a contract basis is technical research. The relatively small size of most firms inhibits them from undertaking research work except on the most limited scale. The tendency towards secretiveness and provincialism exhibited by several of the bigger companies has thus far stood in the way of any joint research enterprises. Several attempts have been made to form an industrywide technical association but none has been successful. The one organization which does cut across company lines in the technical field is the Cellulose and Paper Branch of the government-operated Forest Research Institute, at Dehra Dun.

This organization consisted in 1953 of some thirty-five people, eight of whom were chemists. The operating budget for the year was about Rs. 70,000 of which approximately Rs. 30,000 came from the industry and the balance from the Government. The industry contribution was prorated between the mills on the basis of a four annas

(Rs. 0.25) per ton cess on output. This amounted to 0.018 per cent of the realized price of one ton of white printing paper. Many of the companies objected to paying even so small a sum as this and protested vigorously when, in early 1954, the levy was raised to one rupee per ton (0.073 per cent of sales revenue), in response to government pressure.[1] The companies contended that the research being performed by the Cellulose and Paper Branch was too theoretical and that few mills benefited from its activities. They pointed out that the government researchers were completely without mill experience, that they devoted most of their time to projects in which the manufacturers had no interest, and that they failed to give much help in solving practical operating problems. Although dissatisfied with the work being done at the Forest Research Institute, the paper firms have come up with no workable solution of their own to the research question. Attitudes on this subject vary widely between company managements. Some feel that they are getting along quite well as they are; others acknowledge the desirability of research, but believe that it is cheaper to adopt the innovations of Western technology than to do their own experimentation. A third group feels that the Indian industry is still too small to be able to sustain its own research program but that it will be able to undertake such activity in a few more years. Meanwhile, a great many production problems remain imperfectly solved, and equipment designed for Europe and America continues to be used with few modifications for Indian conditions.[1] Paper mill technologists are very much aware of this situation but they have not as yet convinced management of the feasibility of the reforms they propose.

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[1] The industry is not legally required to contribute to the Forest Research Institute. It does so by informal agreement with the Government, preferring such an arrangement to the alternative of statutory compulsion.

Problems of technical research bear a close relationship to the type of pulp and paper making equipment used and this in turn is affected by the technology of the country from which the equipment was imported. The not unexpected fact that the Indian industry has depended heavily on British suppliers for many years is illustrated by statistics on imports of paper mill machinery. These are shown in Table III for the period from 1920-1921 through September of 1953.

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1. Among the unsolved problems which have resulted from the application of softwood pulping technology to the treatment of bamboo the following may be mentioned. Up to the present time no completely satisfactory method has been devised for reducing the hard and hollow stems of bamboo to fragments of uniform size suitable for digestion. Bamboo pulp does not lend itself to being blown from digesters in the manner of coniferous wood pulps and, because of its dark color, it requires excessively large inputs of bleaching chemicals. Bamboo's high silica content which is transferred to the cooking liquors in the process of digestion, tends to clog up chemical recovery equipment not designed to tolerate it.

For further discussion of the limitations of Indian paper technology, see the following articles in Indian Pulp and Paper: M. P. Bhargava, "Lop Sided Progress of the Paper Industry," July, 1953, pp. 30-35; and J. C. Aggarwala, "Some Problems of the Indian Paper Industry," July, 1950, p. 47 ff.

TABLE III

INDIAN IMPORTS OF PAPER MILL MACHINERY, APRIL, 1920, THROUGH SEPTEMBER, 1953(a)

Period (1)		Value in 1000 Rupees (2)	Per Cent from United Kingdom (3)
1920-21 through	1924-25	9,316	More than 85%(b)
1925-26	1929-30	6,116	More than 85%
1930-31	1934-35	3,895	86.2
1935-36	1939-40	10,183	56.0
1940-41	1944-45	12,730	80.7
1945-46	1949-50	31,916	72.1
1950-51	Sept. 1953(c)	59,979	41.5

(a) Seaborne Trade of India, op. cit., 1921 to 1953.
(b) Estimated; sources of equipment imports prior to 1927 not given in Seaborne Trade data.
(c) Three and one-half years only.

Since India has never had any indigenous manufacturers of paper mill machinery, records of imports are significant indicators of the growth of capital investment in paper making facilities. Column (2) of Table III shows that there was a relatively heavy influx of paper machinery after World War I, followed by a period of light investment from 1925 to 1935. Mill capacity expanded quite rapidly from 1936 to 1940, levelled off during the Second World War, and rose enormously after 1948. The near monopoly of British equipment suppliers was seriously challenged by imports from Germany between 1937 and 1939 but was largely restored by wartime and postwar conditions. Since 1948, however, the situation has become more competitive and large shipments of new equipment have been received from the United States, Canada, Germany, Belgium, and Sweden. It is unlikely that

British equipment makers will ever regain their former share of the market or that Indian paper mills will fail to benefit in the future from technological advances made outside of the United Kingdom. Nonetheless, the lion's share of Indian paper will continue to be made on British machines for some years to come. Of the forty-six paper machines in the mills on January 1, 1954, twenty-seven were of British origin, seven were from Germany, four were from Belgiu, and the remaining eight had either Swedish, American, Canadian, or Japanese ancestry.[1] One company, James Bertram and Sons, has built nineteen of the forty-six machines but no other manufacturer has fabricated more than five. This diversity of equipment makes, which has increased in recent years, continues to raise problems in the field of manufacturer services and supply of spare parts. Up to 1954, no equipment manufacturer had found it advisable to set up a sales and service organization in India.

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[1] The introduction of Japanese made paper machinery to India is a very recent innovation which may have significant implications for the domestic paper industry. Although there is only one very small and recently installed Japanese machine among the twenty mills covered by this study, a new machine from that country was in the process of being installed, early in 1954 by a young and progressive company located near Bombay. This company, called Paper and Pulp Conversions Limited or PAPCO, has not been mentioned previously since, although it makes some coarse papers, it is primarily a board mill. It is introduced here because it is engaged in an attempt to show that certain types of paper and a variety of boards can be produced economically on a relatively small scale by using Japanese equipment.

PAPCO's new machine was especially designed to meet Indian conditions and is notable for being smaller, lighter, and far cheaper than equivalent machines manufactured in Western countries. Whether Japanese equipment can perform efficiently and economically in India for an extended period of time remains to be seen. If it can do this, it may provide an important alternative to the use of costly, large-scale, Western equipment in certain areas of Indian paper making.

The problem of maintaining adequate inventories of spare parts without tying up inordinate amounts of working capital in the process continues to plague the Indian paper firm. As was mentioned earlier, all of the mills fabricate some of the parts which they need, but they still remain heavily dependent on foreign suppliers for many items. The situation surrounding the import of mill supplies from abroad will be considered in the next chapter, following a discussion of raw materials and of other physical inputs requisite to paper making.

CHAPTER 3

Raw Materials and Physical Inputs

The physical ingredients required for the manufacture of pulp and paper may be grouped under four main headings. They are (a) fibrous raw materials, (b) fuel and power, (c) chemicals, and (d) water. The kinds of raw materials, the sources of heat and power, and the nature of chemical requirements will vary, as would be expected, from country to country and between different processes.

The principal fibrous materials used by the Indian industry are shown in Table IV. From this listing it can be seen that bamboo, of which nearly three hundred thousand tons were consumed in 1953, is clearly the dominant one. Second in importance to bamboo is sabai grass, which was the primary indigenous raw material of the industry during the first three decades of the present century. Supplementing these forest products are industrial and commercial remnants and discards in the form of mill cutting, used rags, and waste paper. Of relatively small significance to the industry as a whole but of consequence to particular mills are inputs of bagasse (sugarcane fiber), spruce, salai wood, hemp, and imported wood pulp.

Table IV shows that of the nineteen mills which were in production in 1953, ten are primarily bamboo users, two base their operations chiefly on sabai grass, six are almost entirely dependent on supplies

TABLE IV

INPUTS OF FIBROUS RAW MATERIALS
APPROXIMATE FIGURES FOR 1953
IN THOUSANDS OF LONG TONS(a)

Mill Number	Forest Products		Urban Wastes		Other Indigenous Materials	Imported Woodpulp
	Bamboo(b)	Sabai Grass	Waste Paper	Rags Etc.(c)		
1	1.5	--	1.8	0.2	--	--
2(d)	2.0	--	0.1	--	--	--
3	23.0	11.0	0.7	0.5	--	1.2
4	--	--	0.5	0.5	--	--
5	--	--	3.6	1.7	--	0.1
6	--	--	0.7	2.0	--	--
7	20.0	--	--	1.0	--	0.1
8	11.0	--	0.4	1.1	--	0.6
9(d)	--	--	--	--	--	--
10	80.0	0.3	--	--	--	--
11	--	--	1.5	--	--	--
12	9.5	--	1.2	1.2	3.0 Spruce	0.3
13	26.0	--	6.0	--	2.6 Bagasse	--
14	--	30.0	0.7	7.9	--	--
15	18.0	--	0.5	0.4	3.0 Salai Wood	--
16	--	14.0	0.2	0.2	--	--
17-18	95.0	3.7	4.8	4.8	--	0.1
19	--	--	--	1.8	1.4 Hemp	--
20	--	1.0	1.8	0.2	--	--
TOTAL	286.0	60.0	24.5	23.5	10.0	3.6
PER CENT	70	14.5	6	6	2.5	1

(a) These are unofficial figures based on data supplied by mills and by paper experts. They apply to "average" months and do not take account of strikes or other irregular production stoppages. They assume an annual production of 145-150,000 tons versus actual production of 138,000 tons in 1953.

(b) Includes Eeta reeds which are utilized by one mill in Travancore-Cochin.

(c) Includes high grade cotton waste and tailor cuttings as well as old rags, rope, and sacking.

(d) Mill No. 2 did not begin production until late November of 1953 and Mill No. 9 was not expected to go into operation until late in 1954. It was anticipated that when these two mills achieved full production they would consume 50,000 tons of bamboo and 30,000 tons of salai wood.

of rags and waste paper, while a single unit uses hemp and hemp rope waste exclusively in its manufacture of cigarette paper. Of the six mills which subsist on the reprocessing of paper and rags, all are small producers.[1] In two of them the pulping equipment has so deteriorated as to be capable of processing only small quantities of bamboo and grass, respectively, while the other four have no pulp mills at all. As can be seen, the consumption of waste paper and rags is not confined to these smaller units but extends to almost all of the mills. By Western standards, however, utilization of reclaimed paper is relatively low, amounting to only about 6 per cent, by weight, of raw material inputs. Because of its high cellulose content, waste paper accounts for possibly twice that proportion, or about 12 per cent, of the fiber content of all finished paper. This may be compared with inputs of about 30 per cent waste paper in the American paper industry.[2] Rag consumption includes the use both of high quality hosiery and tailor cuttings and of tattered and grimy "sweeper" rags collected from households and city streets. Both grades of rags are utilized in the making of better grades of printing and writing papers although the condition of the sweeper rags makes for low yields and a relatively high proportion of impurities in the pulp. Most rag material is of cotton, but a certain amount of jute waste and old gunny bags is also utilized in the making of wrapping papers.

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[1] The major products of these six units were low grade, unbleached papers, the bulk of which were purchased by central and state government departments.

[2] In 1953, waste paper amounted to 29.97 per cent by weight of the fibrous material inputs of the American paper and paperboard industry. This figure was derived from consumption and production figures in U. S. Department of Commerce, Facts For Industry, (Series M 14 D-03), "Woodpulp, Paper, and Board 1953 (Preliminary Report)," pp. 1-2.

Woodpulp, domestic or imported, has played a very minor role in Indian paper making in recent years. Small quantities of spruce have been brought down at considerable expense from the mountains of the Kashmir for making groundwood pulp in one mill. In another plant, a relatively cheap hardwood called salai has been converted into chemical pulp on a small scale. Imported woodpulp, which less than twenty-five years earlier, had accounted for as much as 60 per cent of fiber inputs, contributed less than 2 per cent to that total in 1953. This is in contrast to the situation in the rest of the world where the pulp from coniferous softwoods comprises 85 to 90 per cent of all pulp production.[1]

In Table V are listed the principal inputs in the Indian paper making process. Beside them are tabulated, in summary form, data on geographical sources, and approximate cost and consumption figures for 1953. A column indicating freight charges has also been added to show how much transport costs within India, from source to mill, tend to add to the prices of these inputs. The fairly

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[1] FAO, Raw Materials for More Paper, op. cit., p. 3.

TABLE V

SOURCES, COSTS, AND CONSUMPTION OF RAW MATERIALS, FUEL, AND CHEMICALS(a)

Input	Major Sources	Delivered Cost per Long Ton in Rs.	Freight Charges Rs/Long Ton	Approximate Consumption in 1000 Long Tons--1953
1. Bagasse	Northeast, Central and South India	45	None	3.0
2. Bamboo	East, Central and South India	35- 90	5- 35	290.0
3. Grass (Sabai)	Northeast India and Nepal	100- 120	10- 30	60.0
4. Wood:				
Salai	Central India	20	5- 10	3.0
Spruce	Kashmir	170	100	3.0
5. Rags:				
Waste	Urban Areas; Textile Centers esp. in Western India	100- 200	10- 20	23.0
Cuttings		600- 700	10- 20	
6. Paper:				
Waste	Urban Areas	100- 200	10- 20	24.0
Cuttings	Larger Cities	350- 450	10- 20	
7. Woodpulp	Scandinavia	700-1100	10- 70	3.6
8. Coal	Eastern and Central India	18- 45	4- 25	506.0
9. Alum	Uttar Pradesh and Bihar	150- 300	40- 90	. . .(b)
10. Caustic Soda(c)	Delhi, Madras, West Bengal and Imports(d)	680- 800	10-100	17.0
11. China Clay	Bihar, West Bengal, Trav-Cochin & Imports	80- 160	10- 30	20.0
12. Chlorine(c)	Delhi, Madras, West Bengal	660-1000	40-350	8.0(e)
13. Lime	Central India	40- 60	10- 20	. . .(b)
14. Rosin	Punjab, Uttar Pradesh, and Imports	750- 950	60- 80	2.5
15. Salt Cake	Rajasthan	130- 180	30- 80	11.0
16. Soda Ash	Bombay, Saurashtra, West Bengal and Imports	400- 500	50-100	9.0

(a) These figures are approximations only. They are based on information made available by representatives of the paper mills and of Imperial Chemical Industries (India) Ltd., supplemented by statistics for 1952 from the Ministry of Commerce and Industry of the Government of India.

(b) Not known.

(c) Six paper mills have their own electrolytic plants in which they manufacture part of their requirements of caustic soda and chlorine. The output of these units is included in the column under consumption.

(d) Almost all imported chemicals were from the United Kingdom.

(e) Includes the chlorine equivalent in small amounts of bleaching powder used.

wide cost ranges shown for several input categories are attributable to differences in freight charges, to variations in grade, to regional disparities in labor costs, and to fluctuations in price with changing supply-demand equilibria. The broad span of freight charges reflects differences in the distances between mills and localized supply sources.

In the case of bamboo, the average price per ton was about Rs. 75 f.o.b. mill during the past year, yet in the State of Mysore, owing to low wages and the proximity of the mills to the forests, bamboo was available at a delivered price of Rs. 35 per ton.[1] At the opposite extreme, Assam bamboo, whose price was Rs. 55 per ton f.o.b. at railheads, cost Rs. 90 or more when delivered to mills near Calcutta. A somewhat similar situation obtained with sabai grass which cost far less at loading points in Nepal than it did in India. This difference was almost equalized by freight costs which were 200 per cent higher from Nepal than from nearby Indian sources. The average cost of grass was around Rs. 105 per ton, a price appreciably higher than that of bamboo especially in view of the fact that the fiber yield from both is about the same, i.e., 35-45 per cent.

The distribution of bamboo is much more widespread than is that of grass. Whereas the latter is mostly confined to the hills of Nepal and Uttar Pradesh and to limited jungle areas in West Bengal, Orissa, and Bihar, the former is to be found in most of the states of India.[1] Bamboo stands in West Bengal and Bihar have been extensively exploited for many years, but those in Madhya Pradesh, Hyderabad, and Orissa have been brought into use only recently. Still unutilized are large bamboo forests in parts of these Central Indian States and in the States of Assam, Bombay, Coorg, and Madras.[2] No such untapped sources of sabai grass are believed to be still in existence.

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[1] This price and others quoted below are based on data given to me by mill officials.

The coniferous softwood forests of India are nearly all in the Himalayas at levels of 7000 feet and above. As of 1953, no economical means had been found for transporting large quantities of such softwoods down to the plains. Far more accessible but utilized to only a slightly greater extent are resources of salai wood and bagasse. Salai forests are to be found growing on the central plains while the sugar cane from which bagasse is taken is cultivated extensively in Uttar Pradesh, Bihar, Hyderabad, and Bombay.

Cost figures shown for bagasse, salai, and spruce are based on single small-scale operations and should not be taken as indicative of what delivered prices of these materials would be, were they exploited more fully. With respect to waste paper and rags, the very wide price differential between high and low grades is shown. Since these materials mostly come from cities and towns within a radius from the mills of a few hundred miles or less, freight charges on them are relatively low. The broad range in the price of imported woodpulp is a consequence of differences in quality and of fluctuations in world prices of that commodity combined with variations in freight costs from ports of entry to the mills.

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[1] The location of these states is shown on the map of India in Fig. 3.

[2] Discussions of sources, availability, and growth of bamboo are to be found in : Krishnaswamy, V. S., "Bamboos-Their Silviculture and Management," Indian Pulp and Paper, July, 1952, p. 61 ff., and Deshpande, P. R. "Bamboo an Important Raw Material for Pulp and Paper Industry," Indian Pulp and Paper, January, 1954, pp. 337-340.

Measured on the basis of tonnage, the input of greatest magnitude in Indian paper making is that of coal, amounting to about one-half million tons in 1953. Coal consumption per unit of output varies widely between mills in accordance with the efficiency of equipment, the degree of integration of functions, the quality of the coal itself, and the extent to which power is purchased from outside. For the industry as a whole, average consumption is about 3.5 tons of coal per ton of paper, with some units burning as much as five tons and others less than two tons per ton of product.[1] In 1953, coal costs varied from Rs. 14 to 20 per ton at the pits, plus freight costs and labor welfare cesses ranging from as low as Rs. 4 per ton for one mill in West Bengal to as high as Rs. 25 per ton for the units in Mysore. Coal, being still in short supply, has remained subject to Government allocations which have required a number of industries, including pulp and paper, to consume a proportion of low grade coal along with the better grades.

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[1] All but two of the mills burn coal for steam raising purposes. The two exceptions, being located near seaports but far from the coal fields, burn fuel oil. About one-third of the mills are at least partially dependent on outside power.

With respect to the chemicals and nonfibrous materials also listed in Table V, it may be noted that India was self-sufficient, or nearly so, in most of them in 1953, but that prices, especially those of caustic soda, chlorine, and soda ash were very high.[1] The quality of these indigenous materials is, in general, slightly lower than that of imports. The quality of lime in particular is very low, causing it to give trouble when used in equipment designed for better grades.

The fourth of the major input groupings mentioned in the beginning of this chapter as being essential to paper making is clear, fresh water in adequate supply. In most paper producing countries free flowing streams are so commonplace that water is considered a free good and its supply presents no problem. In most of India, however, where the annual weather cycle comprises nine months complemented by three months of torrential monsoons, the situation is quite different. In the whole country there are only a few rivers with sufficient sustained flow through the summer months to assuage the thirst of a large pulp and paper plant. This statement is made more understandable if it is realized that Indian mills use from fifty thousand to two hundred thousand gallons of water per ton of paper produced. In the case of the new Nepa mill, it is anticipated that eight million gallons per day will be required. To meet this need during the dry season a water works and a dam together costing Rs. 4,615,000 have been constructed.[1] Less expensive supply schemes have sufficed for other firms although sometimes at the price of periodic shutdowns and lost production.[2]

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[1] Among the items of which there is still no indigenous supply are chemical dyes and high quality, precipitated chalk.

Almost as troublesome as the dry spells are the monsoons which make river water so turbid and discolored that mills with inadequate purification systems can make only brown papers as long as the rains continue. A third problem associated with water supply is that of plant effluent. The discharge of wash waters containing chemical and organic residues needs to be diluted with a large flow of uncontaminated water if it is not to affect water users downstream. Where the flow of the stream is barely enough to sustain the mill and where, as is generally the case, villages and towns depend on the river for all of their water needs, pollution problems, which are a universal bane to paper mills even where stream flow is large, often become quite critical. Up to the present time, insufficient attention in the selection of plant sites has been given to considerations of water supply and of effluent disposal. As a result, many of the mills are badly situated in respect to their water needs while some are deterred from expanding their output due to lack of adequate stream flow. This holds true for mills in the drier Central and Western States more than for those in West Bengal or South India.

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[1] Government of Madhya Pradesh, Directorate of Information and Publicity, The Nepamills, Nagpur: 1953, p. 41.

[2] Two small mills depend entirely on restricted municipal water supplies. Six others use tube wells from which they get clear hard water in limited volume. The rest of the paper concerns utilize river water with varying degrees of treatment.

The major determinants of location, other than water supply, are fuel and raw material inputs, and access to markets. Labor supply, being cheap and ubiquitous, has not been a primary locational factor.[1] The nature of the market for paper, which is the subject of Chapter Six, will be considered here only insofar as it relates to the selection of plant sites. The most significant fact to be noted with respect to paper sales is that the country is divided into four major, and relatively separate market areas. The two leading areas are the great commercial cities of Bombay and Calcutta with their satellite towns and industrial environs. The secondary market areas are the cities of the North, crowned by Delhi, and the whole of South India with its focus at Madras. Every large-scale factory in the country, except, perhaps, those which produce for purely agricultural consumption, must of necessity be oriented towards one or more of these four marketing regions. This situation has obtained since the time the industrialization of the country began about one century ago.

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[1] For a more generalized and theoretical examination of locational factors, see Mehta, M. M., Location of Indian Industries, Allahabad: Dikshit Press, 1952, especially Chapters I and VI.

In the early days of the paper industry a majority of the newly established mills, including all of the larger units, were to be found in the State of Bengal (now West Bengal) not far from Calcutta. At that time, the only coal deposits which had been developed in the country were situated in the same region. The combined locational pulls of cheap fuel, abundant water, a convenient market, and good sources of raw materials such as jute cuttings and waste paper, seem to have drawn the mills to Calcutta's environs. An additional explanation for their location in this region was the prior establishment there of the large British managing agency houses under whose aegis these early mills were established. The fact that other important raw materials, sabai and, to a lesser extent, ulla grass had to be brought in from areas three hundred to eight hundred miles to the northwest appears to have been outweighed by these prior considerations.

From the founding of the Bally Mill in 1865 until the late nineteen thirties, firms situated in Bengal dominated the paper industry with a near monopoly of the nation's output. As recently as 1937, Bengal could claim 90 per cent of domestic production. Since that year there has been a growing dispersion of the industry with new units having been established and then expanded in seven different states, see Map, Fig. 3. The primary cause for this scattering of productive facilities was the development of bamboo as the principal raw material for paper pulp. Supplementary reasons were the growth of demand in the separate markets, the opening up of coal deposits in Madhya Pradesh, Hyderabad, Bihar, and Orissa, and the intervention of state governments anxious to exploit their natural resources. The share of total output enjoyed by mills in West Bengal had declined to about 40 per cent in 1953 and can be expected to fall still further as the industry continues to grow.

The strength of the locational pulls of physical inputs and of markets is closely related to the relative transport costs of the major inputs and of the finished products. Except for short initial hauls which utilize trucks and bullock carts, transportation of the raw materials and finished products of paper making takes place almost entirely by rail.[1] Consequently, an examination

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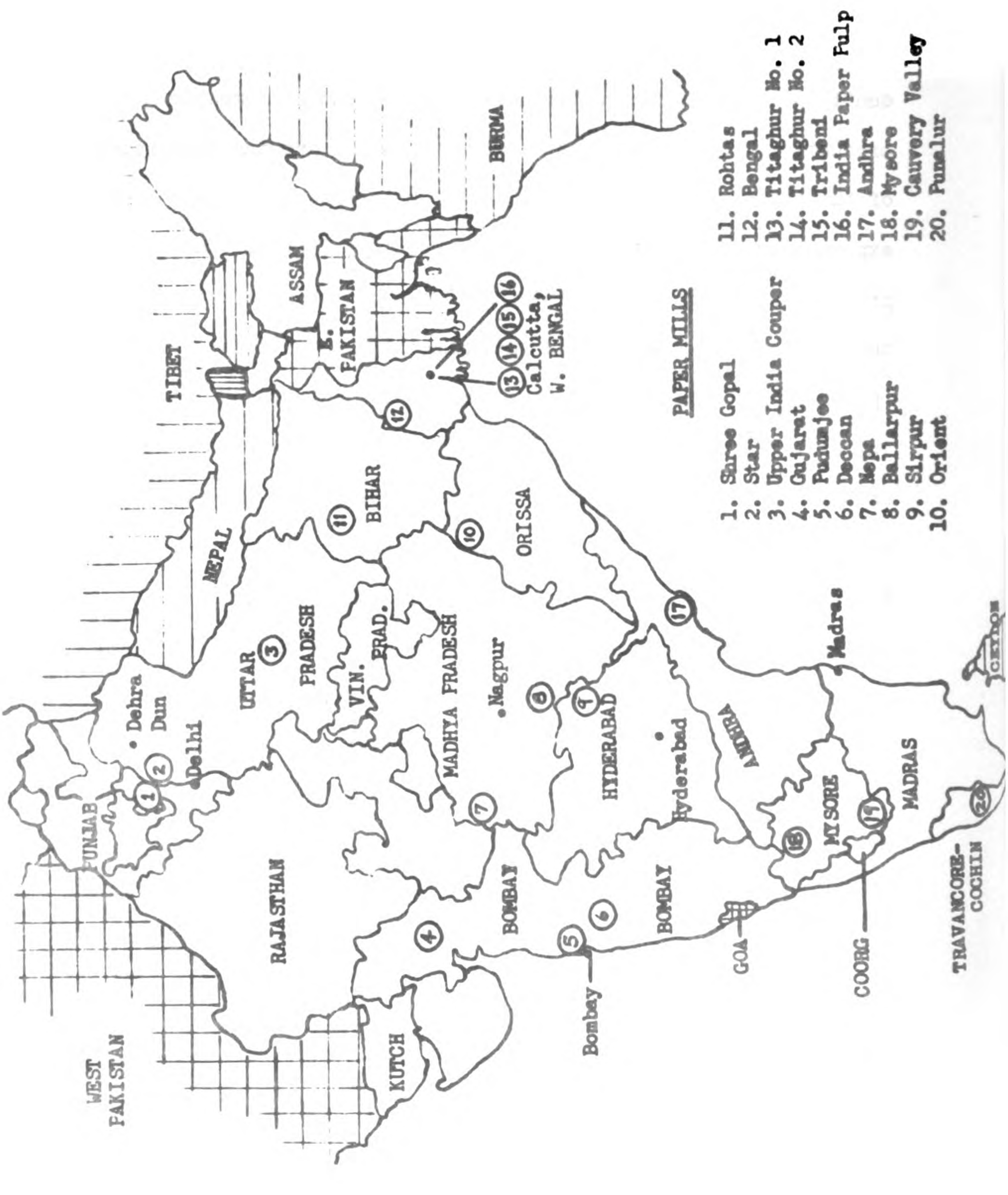
[1] In many Western countries logs are brought to the mills by floating them down rivers. Although this practice is followed to some extent in India with bamboo, it is not widely practicable due to the intermittent flow of the rivers and to the adverse effects of absorbed silt on subsequent processing operations.

FIG. 3 LOCATION OF PAPER MILLS IN INDIA



of rail rates provides useful information on the significance of mill proximity to jungle, mine, and market. As was noted earlier, consumption of coal and fibrous raw materials per ton of output is by no means constant from mill to mill. Average inputs of three and one-half tons of coal and of three tons of grass or bamboo per ton of paper may, however, be used for illustrative purposes. Using these input weightings, Table VI below shows the comparative costs of shipping raw materials, coal, and finished

TABLE VI

RAIL RATES AND WEIGHTED RAIL TRANSPORT COSTS OVER SELECTED MILEAGES(a)

Distance	Rail Rate Per Long Ton(b)			Weighted Cost Per Long Ton of Paper	
	Raw Mtls.	Coal	Finished Paper(c)	Raw Mtls. (x3)	Coal (x3.5)
50 mi.	Rs 3.27	Rs 3.13	Rs 5.26	Rs. 9.8	Rs 10.9
100	5.68	5.26	9.37	17.0	18.4
200	10.30	9.52	17.60	30.9	33.3
300	14.69	10.94	25.83	44.1	38.3
400	17.11	12.36	33.50	51.3	43.2
500	19.53	13.50	41.17	58.6	47.3
600	21.95	14.64	48.84	65.8	51.2
700	24.37	15.78	55.80	73.0	55.2
800	26.79	16.92	62.76	80.4	59.2
900	29.21	18.06	69.72	87.7	63.2
1000	31.63	19.20	76.68	94.8	67.2
1100	34.05	20.20	83.64	102.2	70.7
1200	36.47	21.20	90.60	109.4	74.2

(a) Data in this table were calculated from rates given in the Goods Tariff, Part I, Chief Commercial Superintendent, Central Railway, Bombay, effective 1 October, 1953.
(b) Rates include terminal charges but not transshipment fees nor labor cesses on coal.
(c) These rates are for "paper not otherwise classified, in rolls or reels or in bales or bundles." Charges for boxed papers and stationery are much higher.

paper over various mileages.[1]

Taking the weighted figures in the last two columns of Table VI comparative freight costs for inputs of primary raw materials and fuel per ton of output have been worked out for four hypothetical mills located respectively in Northern Uttar Pradesh, in Central India, in West Bengal, and in Mysore State. Using known distances from input sources to mills actually operating in these areas, the following results were obtained:

Mill Location	Freight Costs of Major Inputs per Long Ton of Output
Northern Uttar Pradesh	Rs. 108 per ton of paper
Central India	Rs. 38 per ton of paper
West Bengal	Rs. 73 per ton of paper
Mysore State	Rs. 73 per ton of paper

The freight advantage accruing to the mill in Central India is quite apparent. This, of course, is only a part of the picture with regard to shipping charges since it does not include the costs of transporting either chemicals or finished products. With respect to the former, no marked advantage through lesser freight costs on chemicals is believed to hold for any one area. Regarding the shipping charges on finished paper, it is apparent that a centrally situated mill will have distinct cost advantages over mills located near the nation's geographical extremities when selling in three out of the four chief market areas.

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[1] Actual shipping costs are slightly higher than those shown in this table due to loading, transshipment, or other charges which cannot be systematically tabulated.

Companies located in the Delhi, Bombay, and South India regions must procure coal from sources five hundred to eight hundred miles away. They have been partially compensated for this disadvantage by a rate schedule for coal which rises very slowly with increasing distance and which charges as much for the first two hundred miles as it does for the next eight hundred. This favorable treatment for long hauls has been extended to a lesser extent to raw materials but scarcely at all to finished paper.

As important to the paper mills as the incidence of freight rates has been the availability or unavailability of freight cars (railways wagons) in the post-World War II period. The deterioration of railway rolling stock during the war years coupled with a growing demand for rail services has led to a continuing and often critical shortage of transport facilities. The direct effects of this shortage are seen not only in the inability of mills to obtain raw materials, fuel, and equipment, and to dispatch finished goods, but also in higher costs of operations. Costs of raw material spoilage, of capital tied up in immobilized stocks, and of extra personnel employed for expediting purposes have all added increments to already excessive operating expenses. An indirect effect of the transport bottleneck has been the restraint which it has placed on plans for expansion of output. Although there are no means of measuring the degree to which projected increases in paper making capacity have been retarded by real or anticipated difficulties in obtaining transportation for fuel, materials, or finished products, such difficulties are believed to have had a significant influence on managerial planning for future production.

The extraction of bamboo, grass, and other fibrous materials from the forests is carried out either by the paper companies themselves, on a so-called departmental basis, or by independent contractors.[1] The contractors may be hired by the companies to perform this particular function or they may be entrepreneurs who bid for cutting rights in state forests, harvest the bamboo with local labor, and sell it for what they can get in the open market. All forests are now owned or administered by the governments of the various states, whereas until very recent years, many of these forests were controlled by *zemindars* (large landholders) who administered them as they saw fit. The intervention of the states was a move to remedy much long standing neglect and abuse and to insure intelligent exploitation and conservation of these privately held natural resources. The results of this change of forest administration are only beginning to be felt, but they can be expected in future years to effect increased bamboo yields and lowered extraction costs.

Unlike coniferous sources of pulpwood which take from twenty to as many as one hundred years to mature, bamboo can be harvested at intervals of four years and will continue to grow for periods of forty to sixty years before going to seed and beginning a whole new life cycle. To achieve full advantage of this growth pattern jungle areas containing bamboo are normally subdivided into four sections, only one of which may be cut in a single year. Whether or not they do the cutting themselves, paper companies try to get contracts of long duration with the states for exclusive cutting rights over large areas of forest. They contend that only those who have long term interests in sustained bamboo yields will adequately develop the potential of the forests and that one year contracts offered to the highest bidder tend to encourage quick profit cutting which has a deleterious effect on later growth.[1] State foresters, on the other hand, point out that bamboo has uses other than as a

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[1] Information on the extraction of forest products was obtained from forestry and purchasing officers of the mills and from forest officers of the States of Bihar, Bombay, and Madhya Pradesh.

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[1] In its annual report for 1948, the Committee of the Indian Paper Makers Association stated that: "Provinces were adopting an almost parochial policy with regard to their bamboo and sabai grass forests. Leases were in the main granted to nationals of a particular Province regardless of the ability of those individuals to exploit the areas leased to them. Almost invariably leases went to the highest bidder . . . [with] bids usually on a minimum royalty basis, which arrangement enabled a lease holder to extract sufficient easily won bamboo from areas contiguous to main roads, depots and railway stations at a highly remunerative rate, which amply covered the minimum royalty and still showed large profits, ignoring those areas not so easily worked." (Indian Paper Makers Association, Report of the Committee, 1948, Calcutta: 1949, p. 26.)

pulp making material;[1] that contractors subject to annual franchises are willing to pay more for cutting rights than are paper companies under long term leases; and that the states are not prepared to forego such income to subsidize the paper makers. The situation in 1953 represented a compromise between these viewpoints, with substantial areas let out on leases exclusively to paper interests and other large segments still subject to annual bids for cutting rights.

These jungle leases vary in duration from one to sixty years, with no general pattern having yet been established. Royalties charged for cutting or stumpage rights are also somewhat varied, ranging from as little as Rs. 3 per ton to as much as Rs. 15 per ton. Stumpage charges are highest in the states of Bihar, Orissa, and Madhya Pradesh where the bamboo is most accessible to the largest consumers.[2] They are appreciably lower in states like Vindhya Pradesh and Assam from which the bamboo has to travel long distances to reach the mills. Exceptions to this rule can be found in the cases of contracts signed in the prewar era, and in those instances where state governments are subsidizing mills with lower rates. In each of the States of Mysore, Hyderabad, and Madhya Pradesh, paper mills have been built with the backing of the State and have obtained for this reason special concessions in respect to the supply of raw materials. As old contracts have expired and as new forest areas have been made available for cutting, states have tended to demand increased royalties despite the protests of the paper making interests. With paper selling at around Rs. 1400 per ton, with over-all pulp and paper profits at a high level, and in view of the critical need for additional investment in forest development and conservation, such increased charges seem to be consistent both with Ricardian rent principles and intelligent forest management. Although abuses of forest lands still persist in some regions, the trend is towards responsible and scientific management of sylvan resources. Current long term leases now specify that the lessee must construct new roads to open up hitherto inaccessible sections while previously neglected areas are being rehabilitated and, in some cases, reforested.

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[1] Bamboo is used in making such varied articles as roofs, house furniture, utensils, scaffolding, cart frames, matting, and toys. The demand from these sources, however, has never begun to match the total supply, with the result that in lightly populated areas most of the existing bamboo has remained unutilized.

[2] In East and West Bengal, no stumpage royalties are charged on bamboo fellings, since the bamboo is considered a village product and is not extracted from the forests.

The job of extracting the bamboo is done by local inhabitants during the dry season from November to May or June. The work is labor intensive, employing mechanical power only after the fibrous material has been cut, dragged to the roadside, and stacked in bundles. The employment provided by these operations is complementary to that of agriculture which makes its greatest demands during the rainy season. The transportation of the bamboo from jungle track to railhead or mill takes place by truck, bullock cart, and occasionally, by river flotation. It is regrettable that there are no known figures which show the size of the addition to rural income which is attributable to the extraction of paper making raw materials from the forests. The writer's estimate of the amount of income derived from the harvesting of bamboo alone is approximately nine million rupees per year.[1]

Working of the forests by contractors is generally cheaper than the same operation performed by companies on a departmental basis, due to differences in wage levels and overheads. Several of the larger mills choose, however, to work some of the areas themselves since this assures them of a steady supply at a reasonable price and keeps them in closer touch with conditions in the forests. Even where they do not employ their own labor or supervision in extracting operations, the paper companies often supply trucks and other items of equipment and maintain depots and loading areas.

The harvesting of _sabai_ grass takes place under conditions quite similar to those described for bamboo. Most of this grass grows wild on hilly tracts and in jungle areas. Like bamboo, it is generally found in mixed forests where its yield is less than

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1. This figure was arrived at on the assumptions of a 1953 bamboo consumption of 290,000 tons at an average price of Rs. 75 per ton less Rs. 17 for rail transport and Rs. 10 for cutting royalties. On the further assumptions that two-thirds of the remaining Rs. 48 per ton is for labor, plus otherwise under-employed village resources such as bullocks and bullock carts, the product is Rs. 48 x 2/3 x 290,000 equals Rs. 9,280,00.

one hundred pounds to the acre. This low yield, combined with the fact that no suitable mechanical means have been found for cutting the sabai, make its costs per unit of weight considerably higher than those of bamboo. A significant attribute of sabai grass is that it will grow on certain types of agricultural wasteland which will support no other crops. Experiments are now being carried out by the Bengal Paper Mill to determine whether grass can be grown as an economical agricultural crop, utilizing such otherwise barren soil. Should this experiment succeed, it would be a boon to land conservation as well as to the raw material supply position of the paper mills of northern India. As in the case of bamboo, the harvesting of grass provides supplementary income to members of the rural population. The estimated return for 1953, based on a labor cost of Rs. 50 per ton for 60,000 tons, would be Rs. 3,000,000. One further significant point regarding the cost and procurement of grass and bamboo concerns losses of these raw materials due to pilferage and spoilage. Estimates given by various mills indicated losses from time of purchase to time of consumption running as high as 25 per cent. Reduction of the incidence of theft and deterioration could yield appreciable savings in the cost of these forest products.

The procurement of waste paper and rags is a much simpler process for paper mills than is the supplying of bamboo and grass. For the most part, both rags and used paper are obtained from contractors who specialize in the collection of these materials.

In some cases the paper makers buy cuttings directly from Government presses or textile mills but on the whole the transactions are handled through middlemen. Several of the managing agencies have set up purchasing subsidiaries whose exclusive function it is to supply particular mills with these commodities on a commission basis. As was mentioned earlier, there are two distinct grades of both waste paper and rags. The top grade is made up of industrial by-products while the lower classification includes whatever is salvageable from household and commercial use. There has been little external competition for the lower quality rags, but the demand for hosiery and tailor cuttings from hard currency areas outside of India had reached such proportions in 1949 and 1950 that the papermakers sought the intercession of the Central Government. The Government complied with their request in 1951 by banning the export of white cotton rags and hosiery cuttings, thus giving the industry an indirect subsidy.[1] In view of the country's shortage of hard currencies, the economic wisdom of such a step appears questionable.

Two other paper mill inputs whose allocations in 1953 were directly subject to decisions made by government authorities were coal and public power. Although mined and distributed by private operators, coal supplies continued to be apportioned among consumers according to monthly quotas set by the central Coal Commissioner. Shortages of external power affected the paper industry chiefly in the states of Bombay and Uttar Pradesh where they resulted in curtailed production from two small mills.[1] For both coal and power it has been a case of demand exceeding locally available supply, with certain qualifying factors entering the picture. The qualifying factors in the case of coal have been the shortage of freight cars and the Government's decision to conserve supplies of grade "A" coal for certain high priority consumers. The shortage of freight cars has caused the paper mills to employ independent agents to arrange for loading the coal and dispatching it from the mines. The function of these agents has been to insure that each client mill was getting its share of the available cars and thus was not going short on deliveries. The commission for this service in 1953 was eight to ten annas per ton, i.e., 2.5 per cent to 4.5 per cent of the mined price of the coal. With respect to power supplies, large hydroelectric and thermal stations have been under construction in many of the states, while existing units are being expanded and linked up in grid systems. However, a more effective use might be made of generating capacity already available were the relatively autonomous states more willing to transmit their power to out-of-state users.

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[1] Indian Paper Makers Association, Report of the Committee 1950, Calcutta: 1951, p. 6, and Report of the Committee 1951, p. 4.

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[1] The Upper India Couper Mill in Lucknow was discovered to be operating at less than 50 per cent capacity in 1953 because its turbine had broken down in 1948. The turbine had long since been repaired, but the mill could not use it, according to management's story, because of the contract which it had with the Uttar Pradesh Electric Supply Co. Under that contract the mill had agreed to buy all of its power from the Electric Company for a ten year period or forfeit a Rs. 25,000 security deposit. This agreement was being followed despite the fact that the Electric Company had never been able to supply more than half of the mill's power needs.

In the realm of chemical costs and chemical inputs the Indian paper industry continues to operate at a considerable disadvantage compared to the mills in Western countries. Experts have pointed out not only that consumption of such chemicals as chlorine and caustic soda is very heavy per unit of output, but also that the prices of these commodities are from two to three times as high as they are in Western countries.[1]

The high levels of caustic and chlorine prices reflect both the generous degree of protection which has been granted to the country's infant chemical industry and the diseconomies of chemical production in a relatively unindustrialized nation. From Table V it can be seen that the paper industry consumed in 1953 approximately 17,000 tons of caustic soda and 8,000 tons of chlorine. Total consumption of these two chemicals by all Indian industries was on the order of 65,000 tons and 9,000 tons respectively.[1] This disproportion between the volumes of the two chemicals required by domestic consumers is of considerable significance in view of the technical processes by which both are manufactured.

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[1] This contention regarding the comparatively high level of Indian chemical prices is confirmed by reference to American prices for the same chemicals derived from tonnage and value figures in U.S. Department of Commerce, Annual Survey of Manufactures 1952, Washington: 1953, p. 156.

Caustic soda is commercially produced throughout the world by either of two methods. The first of these is a chemical process in which soda ash (sodium carbonate) is treated with hydrated lime (calcium hydroxide) to yield caustic soda (sodium hydroxide) and calcium carbonate. This process is utilized to some extent in Europe and America but, outside of the soda recovery systems of the paper mills, it is little used in India, owing to the scarcity and high cost of indigenous soda ash.

The second method is one which employs electric power to break down common salt (sodium chloride) into its component parts. The yields of the electrolytic process are approximately equal weights of chlorine and of sodium hydroxide, with hydrogen gas as a by-product. The costs of electrolysis are such that this second method is economical so long as both caustic and chlorine can be sold at favorable prices.

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[1] These are approximations based partly on information made available to the writer by Mr. J. D. Ilett of Imperial Chemical Industries (India) Limited, Calcutta, in February, 1954, and partly on Planning Commission data in Programmes of Industrial Development, op. cit., pp. 141-142. The other major users of caustic are the soap, textile, rayon, and vegetable oil industries. There are no other large-scale consumers of chlorine in India today.

As was noted on the preceding pages, Indian demand for chlorine does not begin to equal that for caustic and is currently only about one-seventh as large as the latter. This means that domestic production of the alkali is limited by the amount of chlorine that can be sold--a condition which has kept output at low levels despite appreciable recent increases in the capacities of electrolytic plants.

Deficiencies in indigenous caustic production are made up by imports from the United Kingdom. The price of these imports determines the maximum price that can be charged for caustic by the four major Indian manufacturers. Since chlorine is a joint product with caustic, and since it is unaffected by competition from imports,[1] the minimum price at which the chlorine can profitably be sold is determined by subtracting the realization on caustic from the common costs of producing both chemicals. The price of chlorine is prevented from rising appreciably above this minimum by the existence of excess production capacity in this sector of the chemical industry. The comparatively high costs of manufacturing these two products in India are accounted for by the small-scale of production, the high price of power, the low purity of industrial salt, and the tax which the Government imposes on all salt consumed in the country.[2]

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[1] The Government of India no longer permits chlorine to be imported.

[2] Programmes of Industrial Development, op. cit., p. 142.

In the market areas of Bombay, Calcutta, and Madras, each of which is served by one local producer, the prices charged for caustic and for chlorine are quite uniform. In Delhi, which is eight hundred miles from a seaport, a different situation prevails. Freight charges of Rs. 200 per ton on dry weight of caustic shipped from Calcutta or Bombay increase the up-country selling price of imported alkali by that amount. This permits the one electrolytic plant which is located in Delhi to charge an equivalent figure for its caustic, although its manufacturing costs are not appreciably higher than those of other indigenous producers. Its increased realization on the alkali allows the Delhi plant to cover its joint production costs with a lower price on chlorine than its domestic competitors can afford to charge. The Delhi unit can, therefore, sell chlorine in areas which are geographically further from it than they are from Bombay or Calcutta. This situation precipitates occasional but limited price wars in the chlorine market--the limits being set by the high cost of shipping chlorine very far.

To reduce the costs of chemical inputs, six of the paper mills have installed their own electrolytic units.[1] It is said that the older of these plants, built during times when equipment costs were low, can produce chlorine and caustic at a cost appreciably below market prices. There is some difference of opinion, however, as to whether it would pay a mill to install its own electrolytic unit as of 1954.

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[1] The estimated output of these units in 1953 was 3500-4000 tons both of caustic soda and of chlorine.

A number of solutions have been offered to the problem of the high cost of chemical inputs in paper making. Probably the most effective of these would be a reduction in chemical consumption through more efficient pulping methods. Others include the construction of chlorine rail tankers to cut freight costs and the establishment in India of chlorine consuming industries, especially those making insecticides.[1]

Imports from Europe and America, whether of chemicals, of spare parts, or of mechanical equipment are expensive, freighted with delays, and in many ways unsatisfactory from the paper making point of view. Purchases of this sort, unlike those for domestic raw materials, are nearly always handled through the main office of the managing agency. For all imports, government licenses are required. These are applied for through the Development Wing of the Ministry of Commerce and Industry in New Delhi. Approval of this branch of the Central Government is also necessary in obtaining allotments of indigenous iron, steel, and coal. If a paper mill requires more of a particular chemical than it can

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1. India still imports 5,000 to 10,000 tons of bleaching powder annually for the textile industry. This industry could absorb some of the excess chlorine production if a suitable quality of lime, the other ingredient of bleaching powder, could be found.

obtain domestically it may apply for a license, giving evidence of its unfulfilled needs. Import licenses for mill supplies are often granted in as little as one month, but those for new equipment generally require much longer before approval is given. In the latter case, the delays in obtaining a license must be added to those of getting price quotations from abroad and of getting deliveries on equipment once ordered.[1] Imports of mill machinery generally take from two to three years to obtain while those of routine spare parts and "machine clothing" (copper wire screens and drying felts) usually require six months. Extended delivery times force the mills to carry excessively large and expensive inventories of felts, wires, and parts, and to fabricate, insofar as possible, their own substitutes for worn or damaged equipment fittings. Costs of foreign made parts are often inflated, not only by freight, handling, and duty charges but also by the monopolistic pricing policies of the suppliers.

As has been indicated in earlier sections, the role of government in the procurement of raw materials and other paper industry inputs is a far reaching one. As owners or administrators of the nation's forests the governments of the various states have wide jurisdiction over the conditions under which raw materials are extracted. They set stumpage royalties, determine which areas are to be cut, and allocate forest sections as between competing users. In addition, their foresters supervise the planning, opening up, and development of new areas as well as the afforestation of non-productive lands. In the cases of aided industries the provincial governments may also guarantee supplies of forest products at fixed prices. As proprietors of railways and power installations, the Central and state governments fix the rates for freight haulage and electric power and determine the priorities between consumers in the enjoyment of these services. The government Coal Commissioner decides the weights and grades of fuel to which each plant is entitled, while the Ministry of Commerce and Industry passes judgment on the amount of chemicals and the types of equipment which the paper makers may import. The duties to which imports of chemicals, equipment, and woodpulp are subjected are established by the Ministry of Finance, if they are revenue duties, and by the Tariff Commission if they are protective duties. Even in the purchase of rags and waste paper there are evidences of official activity--viz. the previously cited banning of exports of hosiery cuttings by Government at the behest of the industry. In general, the industry has acquiesced in this situation of far reaching government controls while seeking to obtain for itself favorable treatment in particular instances. As examples of this approach, pressures have been brought to bear on government departments and officials to obtain standardization of stumpage royalties, to reduce freight rates, to upgrade rail priorities, to approve allocations of higher grades of coal, and to ban the sale to paper bag manufacturers of waste paper from government offices and presses.[1] The trend, since the early years of World War II, has been towards increased government participation in the making of decisions relating to pulp and paper inputs. No sharp departure from this trend is envisioned in the near future.

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[1] In many cases, prices change while approval is being awaited, thus requiring resubmission of amended applications for further approval with the possibility that prices may change again in the meanwhile.

The interest of the Government in the welfare and performance of the pulp and paper industry is an aspect of the increasing emphasis which is being placed on industrial expansion under the Five Year Plan. One objective of such expansion is increased self-sufficiency in the supply of manufactured goods which can be made in India. With government encouragement, the paper makers have made significant strides in this direction during the past two decades. Table VII shows how raw material inputs (converted into their pulp equivalents for purposes of comparison) had lost their foreign character and had become almost entirely indigenous by 1953.

Imports of woodpulp which had become the principal source of fiber in the early nineteen thirties, subsequently declined to

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[1] See Indian Paper Makers Association, Report of the Committee, op. cit., for years from 1946 through 1953.

TABLE VII

PULP INPUTS FOR SELECTED YEARS, 1923 to 1953(a)
TONNAGES (IN THOUSANDS OF LONG TONS) OF VARIOUS PULPS AND PERCENTAGES OF EACH TO TOTAL PULP USED

Type of Pulp	1923		1931-32		1936-37		1944-45		1953	
	1000 Tons	%	1000 Tons	%	1000 Tons	%	1000 Tons	%	1000 Tons	%
Bamboo Pulp ...	1.5	6.1%	5.2	13.2%	19.3	37.7%	62.3	53.0%	85.8	60.4%
Grass Pulp ...	9.7	39.4%	9.1	22.8%	11.5	22.5%	20.0	17.0%	18.0	12.6%
Other Indig. Pulp(b)	5.7	23.2%	3.3	8.3%	9.3	18.2%	23.0	23.8%	35.0	24.5%
Imported Woodpulp	7.7	31.3%	22.1	55.7%	11.0	21.6%	7.2	6.2%	3.6	2.5%
Total Pulps...	24.6	100%	39.7	100%	51.1	100%	117.5	100%	142.4	100%

(a) Data from 1923 through 1944-45 was extracted and transposed from the following publications of the Indian Tariff Board relating to the grant of protection to the paper and paper pulp industries: Vol. I. *Evidence*, 1925, pp. 35-36, 114-115, 242, 469, and 661; *Report*, 1938, p. 18; *Report*, 1947, p. 10. Figures for 1953 are derived from Table IV *supra* using 30 per cent as the estimated pulp yield on purchased bamboo and grass.
(b) Comprised mainly of rag and waste paper pulp but also including lesser quantities of pulp from domestic woods and agricultural fibers.

very minor significance, whereas supplies of domestic pulps, especially those of bamboo, had expanded considerably. It will be seen also that inputs of *sabai* grass had diminished in relative importance while those of other indigenous materials, notably waste paper and rags, had become increasingly available. The changing trends in the uses of raw materials indicated here can be expected to continue for some years.[1] As mentioned earlier, the country still has large forests of hitherto unutilized bamboos. Although, in 1953, there were no comprehensive forest surveys and no one in India actually knew the full extent of the nation's jungle resources, competent observers agreed that more than one million additional tons of these oversize grasses might be made available for pulping each year. These supplements to present supplies could, by themselves, sustain a paper industry two and one-half to three times the size of the 1953 version.

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[1] Information on changes in raw material prices are both less available and less reliable than those relating to consumption. Scattered figures on *sabai* grass prices, however, suggest that they

However, in addition to bamboo, there are several other raw materials to be taken into account. The most prominent and the most controversial of these is sugarcane bagasse. Much has been said and written about this material and its potential for making paper pulp,[1] but little more than a beginning has been made in India towards actually exploiting it. In simplest form, the arguments for using bagasse as a paper making material in India are these. More than three million tons of this material are produced

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dropped from about Rs. 58 per ton in 1923 to Rs. 35-40 in the nineteen thirties, then rose during the nineteen forties and early fifties to Rs. 100 to 120. Bamboo prices, starting at around Rs. 50 per ton in 1923 declined to as low as Rs. 13 per ton in 1939 but have since risen to many times that figure (see Table V). Indian Tariff Board: Evidence, 1925, op. cit., pp. 115 and 242-3; and Report, 1938, op. cit., pp. 13-15.

[1] See, among others: FAO, Raw Materials for More Paper, op. cit., pp. 101-107; FAO, Tropical Woods and Agricultural Residues as Sources of Pulp, Rome: 1952, chap. 18; and Bordenave, R., "Bagasse for Papermaking," Indian Pulp and Paper, December, 1953, pp. 293-97.

each year as a by-product to the sugar making activities of the country's one hundred and fifty odd sugar mills.[1] At present, the crushed fiber is burned in sugar mill boilers with the dual purpose of generating steam and disposing of a bulky waste. Technically speaking, good quality printing and writing papers, and even newsprint, can be made from bagasse, while steam can be generated much more efficiently by firing boilers with coal.

The arguments against utilizing bagasse are almost entirely economic ones and relate particularly to transport and handling costs. Unless these costs can be minimized, bagasse is not economical to use. Paper mills based on crushed cane must be situated very close, if not adjacent, to sugar mills and must provide for extensive storage space since crushing operations are restricted to a four to five months period in the winter. In addition, the coal which is used as a replacement fuel must be cheap and, therefore, near at hand. There are few sugar mills capable of crushing enough cane to sustain an economic pulp mill so that a location may have to be chosen where there are several neighboring cane crushing units. It is believed that there are a small number of locations in the states of Bihar and Hyderabad, where printing and writing papers can be made from

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1. "Wrapping Paper from Bagasse." Government of India, Press Information Bureau Bulletin, New Delhi; November 2, 1950.

cane fiber on a commercially profitable basis. Whether newsprint can also be made from bagasse at a competitive cost is considerably more doubtful.[1] Changes in world prices of newsprint could, of course, alter this conclusion.

Other raw materials of growing or potential importance are waste paper, Himalayan conifers, and tropical hardwoods. As paper consumption increases there must necessarily be proportionately increased quantities of used paper which may be salvaged and reused. Higher per capita consumption should make the collection of waste paper a more inexpensive operation and should permit the paper industry to make better use than it does at present of this source of already processed fiber. The domestic conifers and tropical hardwoods have not yet achieved importance as pulping materials but they could do so in the future, particularly in regard to the making of newsprint. The firs and spruces of the higher mountain areas may well become the groundwood pulp of the future, once the mountain regions have been opened up by proposed roads and rail lines whose construction costs cannot be justified for this purpose alone.

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[1] Conflicting opinions on this subject have been expressed by Dr. R. V. Bhat, Officer-in-Charge, Cellulose and Paper Branch, Forest Research Institute, Dehra Dun, and Dr. J. E. Atchison, former Chief of Mutual Security Administration, Pulp and Paper Division, Washington, D.C. Dr. Bhat has suggested that newsprint can be made from bagasse at reasonable cost (Bhat, R. V., "Bagasse Paper as Newsprint," Indian Pulp and Paper, August, 1953, pp. 123-129), while Dr. Atchison has said: "In spite of the great publicity given to the use of bagasse for newsprint, production of this particular product from bagasse seems to be at the bottom of the list so far as economic feasibility is concerned." (Atchison, J. E., "Utilization of Sugar Cane Bagasse in the Pulp and Paper Industry," Paper Trade Journal, October 17, 1952, p. 24).

Experiments are now being conducted with plantations of bamboo, paper mulberry, eucalyptus, _salai_, and _maharukh_ (a variety of ailanthus), in the hope that afforestation with one or more of these species will substantially increase the country's fibrous material supplies in future years. In addition, a limited amount of actual reforestation has been undertaken by several of the state governments. However, such progress as has been made in this respect represents only a small fraction of what might be done to reclaim barren lands and to expand sylvan resources. There is still widespread need for improved forest management, for more effective integration of largely independent forest industries, and for silviculture on a vast scale. The chief impediments to large scale reforestation are the heavy investments and the delayed returns inherent in such operations. Presumably because of more immediately pressing demands on their capital resources, neither the Central nor the state governments have yet made any extensive, long term, investments of this sort. When and if such capital commitments are made, it is believed that they will have a significant effect on the costs of paper making raw materials. The subject of costs in the paper industry is treated in the following chapter.

CHAPTER 4

Cost Structure and Cost Comparisons

A study of the costs of manufacturing paper in India is subject to a number of limitations and obstacles. Like other companies all over the world, the paper firms tend to regard their cost figures as more or less confidential and to be understandably hesitant about showing them to an outsider. What is more, the majority of these concerns keep only the most fragmentary expense records, while cost accounting practices have been introduced into only a small number of mill offices.[1] A third problem arises from the diversity of the companies in terms of size, age, location, inputs, and outputs. No one of the twenty mills can be considered representative of the group, so that, in the absence of cost data for all firms, no evaluations in absolute terms can be made.

Nonetheless, for the information which they do reveal, the works costs of five mills during an average month[2] in 1953 are shown in Table VIII. The mills have been listed in order of declining size, ranging from annual capacities of 15,000 tons down to 2,500 tons. As can readily be seen from a glance at the totals, size does not appear to be the most important factor in determining the level of operating expenses among these five units.

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[1] The absence of cost accounting in at least one mill appeared to be attributable to an unwillingness on the part of the management to keep the sort of records which would enable government tax officials to obtain accurate checks on production and profits.

[2] Average refers to either a representative month or to a weighted average over a six month period.

TABLE VIII

MANUFACTURING COSTS OF FIVE INDIAN PAPER MILLS EXPENDITURES PER TON OF PAPER DURING AVERAGE MONTHS IN 1953(a)

Cost Category	Mill A		Mill B		Mill C		Mill D		Mill E	
	Rs/ Ton	%	Rs/ Ton	%	Rs/ Ton	%	Rs/ Ton	%	Rs/ Ton	%
Raw Materials...	315	33	243	21	208	20	228	23	347	35
Chemicals.(b)	130	13	256	22	294	28	225	22	114	11
Wages and Salaries.	199	21	282	25	64	6	251	25	211	21
Fuel and Power...	119	12	66	6	111	11	78	8	133	13
Overhead Costs...(c)	199	21	292	26	375	35	217	22	201	20
Total....	962	100	1140	100	1052	100	999	100	1006	100

(a) Data for this table were obtained from officials of each of the five mills, all of which are integrated pulp and paper units. Costs for Mill E apply to a lower grade of printing and writing papers than do those for the other mills in this table.
(b) Includes china clay.
(c) Includes stores, maintenance, depreciation, housing, welfare, and miscellaneous mill expenditures.

Raw material expenditures are seen to fall into two distinct groups representing approximately 21 per cent and 34 per cent of costs respectively. Mills using bamboo enjoyed the lower costs, while those depending primarily on grass or rags had to spend considerably more for these materials. Chemical costs, by contrast, were high for treating bamboo and low for processing other fibrous ingredients. Chemical expenditures for Mill C were exceptionally high due to this being a new mill which had not achieved normal operating conditions when these figures were recorded. The newness of this mill also accounts for its unusually low personnel costs. The figure of 6 per cent for wages and salaries contrasts sharply with the 21 to 25 per cent of the other units. Variations in fuel and power costs are attributable principally to the differing distances of the mills from sources of coal and secondarily to disparate efficiencies of steam and power generation. The final item, overhead costs, is a comprehensive category covering such diverse mill expenses as those incurred for repairs, depreciation, medical facilities, housing, and administration, but not such items as interest, selling costs and managing agency fees which are usually charged to a company's head office. It will be noted that overhead costs were exceptionally large for Mill C, the new unit. About 60 per cent of such costs consisted of depreciation of high priced new equipment--an expense item which will decline considerably within the next three to five years. Other expense items for Mill C, notably fuel and chemicals, could be expected to diminish markedly within six months when full operating efficiency had been attained. Other things being equal, then, the owners of the modern mill could anticipate a production cost advantage within a few years of between 20 and 30 per cent relative to most other firms.

The unavailability of cost breakdowns from the larger mills and the tendency of other influences to obscure the effects of size on cost of operations necessitate resort to engineering estimates to illustrate the economies of increasing scale of production. One such estimate by an international paper expert, which compares the costs of production of two hypothetical Indian mills making bleached slush pulp from bamboo, is shown in Table IX. The first of these units has an annual capacity of 8,000 tons, uses an old fashioned chemical recovery system, and has a chemical consumption which is average for Indian mills. The second mill has a 16,000 ton per year capacity, with modern recovery and washing systems.

TABLE IX

COMPARATIVE PRODUCTION COSTS OF TWO PULP MILLS DIFFERING IN SIZE AND UP-TO-DATENESS OF EQUIPMENT (a)

Cost Category	Production Costs. Rs/Ton	
	8,000 ton mill	16,000 ton mill
Bamboo....................	Rs 206	Rs 206
Chemicals & Miscellaneous.	233	111.50
Steam and Power...........	94.50	42
Labor.....................	22	18
Repair Materials..........	25	20
Supervision & Overheads...	40	30
Capital Costs.............	181	169
Total Pulp Production Costs	801.50	596.50

(a) These estimates were made by Mr. Arne Sundelin, a Swedish paper expert who made a technical survey of the Indian pulp and paper industry in early 1953 under FAO sponsorship. FAO, Report to the Government of India on a Preliminary Pulp and Paper Survey, prepared by Arne Sundelin, Rome: March, 1954, p. 31.

According to these estimates, the 25 per cent cost advantage achieved by the larger mill is attributable principally to savings on chemicals and on steam and power. Although the effects both of larger scale operations and of more modern recovery equipment are introduced in this comparison, it should be made clear that the two are inseparable, since, as noted in Chapter 2, the more efficient recovery system presupposes production at the 15,000 tons per year level or higher. It is by no means inevitable that mills will achieve greater economies of operation as they increase their capacity, but the potential for so doing seems clearly indicated. Indian managements have come increasingly to accept this contention in recent years.

While the current trend in mill scale operations is towards larger units, the opposing tendency, which favors the development of paper making by hand methods also merits consideration from the cost standpoint. In order to compare the economics of factory and of manual processes, a cost estimate for the manufacture of kraft paper by hand methods is shown below:[1]

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[1] These figures were transposed from detailed estimates made by the Handmade Paper Research Centre in an unpublished bulletin entitled "Handmade Paper Making: A Home Industry," Poona: 1953, pp. 7-8. They assume a family unit working 25 man hours and 8 woman hours daily to produce 20 pounds of paper per day, or 20 x 300 days divided by 2240 equals 2.7 tons per year. Interest has been calculated at 6 per cent and depreciation at 10 per cent (the latter for 300 days a year only) on a capital outlay of Rs. 5,000. Although the scale of operations is extremely small, cost figures are shown on a per ton basis for purposes of comparison.

Raw Materials	Rs. 112 per ton
Chemicals	161
Labor	595
Fuel and Power	240
Overhead Costs (Maintenance and Depreciation)	292
Total Production Costs	1400
Interest on Capital	112
Total Costs	1512

Before relating these costs to those recorded for actual mill operations in Table VIII, certain qualifying considerations may be noted. The paper produced by the handmade process is a variety of kraft (made from banana stumps and old gunny bags) while the outputs of the five mills are mostly writings and printings. Realizable prices, however, do not differ widely between these particular grades. In the manual method estimate no provision is included for supervision or for housing of operations--it being assumed that these items will take care of themselves in a family type unit. The return to labor has been arrived at as shown below, by taking the residue after subtracting all other cost elements from anticipated sales revenue.

Expected price per ton	Rs. 1680
Less 10 per cent discount to traders	168
Realization per ton	1512
Less total non-labor costs	917
Return to labor	595

This return for 3696 hours of labor amounts to 42.5 per cent of manufacturing costs and yields a wage of Rs. 1.3 per eight hour day. This is about one-half of what the mills are now paying. Despite this low remuneration and the absence of any allowance for packing and shipping charges, labor welfare, or contigencies,[1] the estimated costs of handmade paper turn out to be from 23 per cent to 46 per cent higher than actual mill costs. If, as suggested by the estimates in Table IX, mill costs can be reduced by Rs. 200 per ton through expansion and modernization, then paper making by manual methods can be said to cost at least 75 per cent more than it would in an efficient mill.

The costs of machine made paper have not remained static over time but have moved up and down between fairly wide limits in response both to advancing technology and to changing factor prices. That the relative costs of paper ingredients and inputs have altered markedly over the past generation is evinced by the figures in Table X which show expenditures per ton of output for two British managed mills situated just north of Calcutta.

During the sixteen year span covered by these figures, the India Paper Pulp Company's annual output averaged 6,800 tons while Titaghur's production increased from 19,000 tons in 1931-32 to 25,700 tons in 1947-48. I.P.P. utilized bamboo as its chief raw material and converted it to pulp by the sulfite method. During this same period Titaghur was gradually shifting from grass to bamboo consumption and concomitantly from the soda to the semi-sulfate

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[1] One large contingency is the annual monsoon during which period handmaking operations must cease for lack of drying facilities.

TABLE X

MANUFACTURING COST CHANGES FOR TWO PAPER MILLS BETWEEN 1931-1932 AND 1947-1948 (a)

Cost Category	1931-1932		1936-1937		1947-1948	
	Rs/Ton	%	Rs/Ton	%	Rs/Ton	%
India Paper Pulp Co.						
Raw Materials	144	46	104	35	223	23
Chemicals	55	18	68	23	192	20
Labor	35	11	38	13	157	16
Fuel and Power	17	6	24	8	128	13
Other (b)	60	19	60	20	273	28
Total	311	100	294	99	973	100
Titaghur Paper Mills						
Raw Materials	150	45	104	36	251	30
Chemicals	49	15	56	19	224	27
Labor	42	12	34	12	63	7
Fuel and Power	20	6	22	8	109	13
Other (b)	73	22	73	25	191	23
Total	334	100	289	100	838	100

(a) Costs for 1931-32 and 1936-37 derived from Indian Tariff Board, *Evidence* 1939, Vol. I, *op. cit.*, pp. 186-189. Those for 1947-48 extracted from *Report of the Indian Tariff Board on Paper Prices 1948*, Delhi: Manager of Publications, 1949, p. 23.
(b) Does not include capital costs.

process. Despite these differences in size and technology, the expense breakdowns for the two mills show remarkable similarity during the nineteen thirties.

The most significant cost change from 1931-32 to 1936-37 was a decline of about 30 per cent in raw material expenditures. This was attributable to the increasing use of bamboo and to declining prices of this material. Other costs, especially those of chemicals, tended to rise slightly, but not enough to offset the savings realizable on raw materials. The cost structure shown for 1936-37 did not change significantly until 1940 when the impact of war began to bring about the revaluation of inputs which is shown for 1947-48.

Figures for this third period show wider differences between the costs of the two mills than were indicated in the earlier comparisons, but several common relationships persist. With price inflation having taken place throughout the world during the middle nineteen forties, manufacturing costs for I.P.P. and Titaghur had by 1947-48 reached approximately three times their 1936-37 levels. Leading these price rises were inputs of fuel and power, which reflected national shortages and higher rates in the mining and transportation sectors. Titaghur's costs were pushed up most by increasing chemical prices, while I.P.P., which utilized different chemicals, was more affected by rising expenditures for labor and overheads. Raw material prices were inflated to a lesser extent than those of any other inputs despite sharply increased freight rates. For both mills, the percentages of total outlays attributable to raw materials had declined sharply from levels of the previous decade.

The writer was unable to obtain data which would have made possible exact comparisons between mill costs in 1947-48 and in 1953. However, approximate changes in manufacturing expenditures which have taken place over the past five years can be inferred by comparing cost figures for mills "B" and "D" in

Table VIII[1] with those for the two units in Table X. Such comparison shows raw material costs to have remained almost constant while chemical costs increased and fuel and power expenditures declined. Categories for labor and "other" inputs are not comparable between the two tables, but information from other sources shows that wages and overheads have both increased since 1947-48. The nature of these increases will be discussed in Chapters 7 and 8.

Meaningful breakdowns of the overhead expenses which are normally associated with functions of the head office of a firm are even more difficult to come by than are details of production costs. Head office costs, as distinct from mill costs, normally include expenditures of a firm for selling, advertising, purchase of equipment, outward freight, office expenses, and managing agency remuneration. They may also include such capital costs as interest on working capital and depreciation of fixed assets. The inconsistency of accounting practices between the profit and loss statements of different firms and also between different government reports makes any analysis of the administrative costs of the paper industry somewhat imprecise.

One avenue of approach to the subject of administrative costs is provided by the "official" breakdown of such costs.[1] This is the breakdown used by the Government in determining the prices which it will pay for its annual purchases of paper. By official computation, production costs for white printing paper in 1953 were placed at Rs. 1,027 per ton. To this basic figure were added increments of Rs. 17.5 to cover interest on working capital and of Rs. 64.2 for depreciation. A third increment of Rs. 93.3 was then appended to provide a "reasonable" return of 8 per cent on fixed capital--this last category being interpreted to include managing agency commission, corporate income taxes, dividends, and reserves.[2] The sum of production costs and capital costs yielded the price which the Government paid for its paper. For the civilian market, a further mark-up of Rs. 169 was added to cover selling, advertising, and distribution expenses, including those of outward freight. This data is recorded on a per cent as well as a per ton basis in Table XI.

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[1] These two mills are more closely comparable to I.P.P. and to Titaghur than other units in Table VIII due to considerations of raw materials, age, and products.

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[1] Information from the Development Wing, Government of India, Ministry of Commerce and Industry, October, 1953, supplemented by Report on Paper Prices, op. cit., pp. 10-15.

Further explanation of the Government's role in the pricing of paper will be found in Chapter 6.

[2] The Indian Tariff Board, which set the 8 per cent precedent in 1948, explained its insistence on this low figure by pointing out that the fixed capital of the paper industry amounted to almost twice the face value of the paid up share capital. Thus it reasoned that an 8 per cent return on fixed capital would mean a 16 per cent yield on the shares. What it failed to note was: (a) that most of the share capital had received its face value in pre-inflation days, and (b) that the excess of fixed over share capital was evidence of the very type of capital formation which the country was so anxiously seeking. Ibid., p. 12. It may be noted that paper manufacturing was by no means unique among Indian industries in being officially allowed only such a low return on fixed capital. A similar policy seems to have been fairly generally observed in fixing domestic prices and in setting tariff rates on other commodities.

TABLE XI

BREAKDOWN OF ADMINISTRATIVE COSTS FOR THE INDIAN PAPER INDUSTRY[(a)]

Cost Category	Government Orders		Civilian Market	
	Rs/Ton	% of net realization	Rs/Ton	% of net realization
Production Costs	1027.0	85.4	1027.0	74.9
Interest on Working Cap.	17.5	1.5	17.5	1.3
Depreciation	64.2	5.3	64.2	4.7
Selling, etc. Costs.	———	———	169.0	12.3
Return on Fixed Capital	93.3	7.8	93.3	6.8
Net Realization	1202.0	100	1371.0	100

(a) Development Wing, Government of India, Ministry of Commerce and Industry, October, 1953.

The government figure for production costs shown in Table XI was based on an analysis of the manufacturing expenses of six "representative" mills. Cost data obtained from these mills were tabulated and then arithmetically averaged, giving equal weight to the costs of units whose annual outputs ranged from 1,200 tons to 20,000 tons. Since four out of the six concerns examined were of small capacity, and since manufacturing expenses in small mills tend to be high, the final figures had a distinct upward bias. Because of this rather generous method of calculating production costs, the more efficient units were able to realize profits of up to Rs. 200 per ton on this item alone.

With regard to other cost categories in Table XI, the depreciation allowance is probably a fair mean for the industry as a whole, although it is twice as high as that recorded by a mill such as India Paper Pulp while being less than one-third of the amount written off by a new unit like Ballarpur. The selling and distribution allowance of Rs. 169, which is chargeable only on non-government orders, also allows many firms a comfortable profit cushion. By concentrating their sales in the nearest markets and avoiding long freight hauls, a number of the mills maintain selling costs as much as Rs. 100 below the industrywide mark-up. This would explain the preference of the producers of better quality papers for civilian as opposed to government orders. Unlike the generous authorizations for production and distribution expenses, the return officially allowed on fixed capital is so small that it is doubtful if any company could long maintain itself in a healthy condition were it actually limited to that amount. As indicated above, many firms are able to realize comfortable profit margins over costs because of the "looseness of the rates" on certain other expense categories within the official cost patterns. One of the more successful companies has realized profits since 1950 of from 15 to 23 per cent on net investment while two other firms were showing losses for that same period.

In the writer's judgment, a favorably located and efficiently operated mill can sell white printing paper at a total cost of between eight hundred and nine hundred rupees per ton and enjoy as profit from 30 to 40 per cent of the official selling price. The principal obstacle to the achievement of very low cost operations in a modern mill is the high current price of papermaking equipment. Until such new equipment can be written down appreciably in value, paper making expenses may be inflated by depreciation allowances amounting to 20 per cent or more of production costs as in the case of Mill C in Table VIII.

According to figures obtained from the Planning Commission and from mill managements, the investment cost per ton of output for new mill capacity installed or under erection from 1951 to 1954 varied from Rs. 238 to Rs. 2380.[1] This remarkable range in amount of capital investment per unit of output points up the facts that there are many ways in which mill capacity can be increased and that expansion costs will depend on a host of variables within each mill. Where completely new and integrated production units have been built in recent years, as in the cases of the Nepa and Ballarpur mills, costs have exceeded

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[1] These figures may be compared with an estimated investment of Rs. 1850 per ton of output for handmade paper according to the Handmade Paper Research Centre in Poona. Handmade Paper Making op. cit., p. 10.

Rs. 2000 per ton of capacity. From 60 to 80 per cent of these capital costs are allocable to new machinery and equipment with most of the balance being spent on buildings, residential quarters, waterworks, roads, and railway sidings.[1]

Expansion of already established units tends to be cheaper on a per ton basis than erection of new mills owing to lumpiness in size of equipment and to the possibility of spreading overheads. All of the mills have excess capacity at one or more of the stages of production with the result that substantial increases in output can often be achieved by making relatively small investments to eliminate bottlenecks. In a few cases, however, installed facilities are so well balanced that expansion must take place at nearly every stage if it is to take place at all. In situations where a new paper machine, the bulkiest and most expensive item of all, must be acquired, the purchaser's choice is bound to be influenced by potential economies of scale which may force him to expand considerably more than he had intended. Although large paper machines have considerably lower capital costs per unit of output than do small ones, their use may require large investments for the concomitant expansion of pulping and other mill facilities.

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1. The Nepamills, op. cit., p. 41, and Ballarpur Paper and Strawboard Mills Ltd., Report and Accounts for the year ended June 30, 1953.

Mills seeking to extend their capacities and yet to avoid the large expenditures required for new machinery have followed two courses. The first of these has been to purchase second hand machines and to recondition them; the second has been to speed up the machines already operating, by the installation of high speed drives and other requisite devices. The extent to which used equipment has been acquired is indicated by the fact that more than one-third of the paper machines purchased by Indian mills in the last twenty years were bought second hand. The speeding up of existing units is a production raising technique which is being heavily emphasized at the present time.

The high price of new equipment discourages replacement even more than it restrains expansion. Old machines are rarely scrapped, since they can still turn out good quality paper, albeit at a slow rate. Their heavy use of labor is not considered a serious shortcoming in a land where wages are still low and unemployment remains a grave problem. On the basis of labor savings alone it is difficult to justify replacement of one or more antiquated machines by a single modern one at today's prices. Other cost elements, including quality of paper, use of power, increase of yield, and reduction of overheads will also affect the comparative economies of old versus new machines, but savings attributable to these latter elements are not easily measurable. Also to be considered in making decisions on the advisability of putting in new equipment are such factors as the profitability of the firm, the incidence of corporate income taxes, and the extent to which depreciation is deductible from taxable income. The opportunity available to a profitable firm today to pay much of the cost of new equipment out of what would otherwise be taxed income may induce it to expand and modernize when it would not otherwise do so. The extent of profits and taxes and the nature of managerial organization within which investment decisions are made form the subject matter of the next chapter.

CHAPTER 5

Industrial Organization and Finance

To understand the managerial structure and organization of the Indian paper industry it is necessary to have some familiarity with the so-called managing agent or agency system of which this industry is a child. Of the twenty mills considered in this report, fourteen are operated by managing agencies, three by independent managing directors, and three by state governments. Of these six latter mills, all but one has previously been under managing agency control. The three units having managing directors do not differ markedly from the others in their organization but, perhaps because of their very small size, find it convenient to dispense with the agency trappings.[1] Two of the three government operated mills became state enterprises only because of the inability of private managements to keep them solvent. Both would revert to private operation were any agents prepared to take them over on reasonable terms.

The managing agency system is an inheritance from British colonial times. It was evolved as a means of developing the country economically after that function had been legally transferred from the East India Company to private traders and entrepreneurs in 1833. The essence of the system is the delegation by the owners of a company of authority to manage the company's affairs to a third party. This third party, the managing agent, is in theory (and often in practice) well equipped by experience and business connections to conduct the affairs of the company. A century ago, there was a need for such external management which does not exist today. During the previous century, British investors felt the necessity of having experts in India on whom they could depend to supervise their investments in that country. The managing agencies were developed to meet this need. They grew through the years not only because of the expansion of the Indian economy but also because, in the absence of an organized capital market in the country, they became the chief sources of investment finance and entrepreneurship. With the passage of time, many of the agencies found that their roles had changed. They had evolved from being hired experts into becoming large-scale owners, controllers, and developers of business enterprise. These agents promoted their own clients and founded many of the concerns over which they were to assume all managerial functions. In some cases they retained 51 per cent or more of the common shares; in others they maintained control with much smaller holdings.

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[1] It is not necessarily true that because a firm is small it will fail to utilize the managing agency form of organization. There are many agencies which have been established to administer the affairs of only a single small concern.

The system has survived to the present day without major changes despite the withdrawal of the British from India and the development of Calcutta and Bombay as centers of business and finance. The managing agency has been taken over by the Indian businessman and has been adapted to serve his interests. There have been many abuses of managerial powers and many attempts to reform the system. The most recent proposals for reform currently under consideration by the Government would eliminate the worst abuses but would not seriously affect this institution's dominant role in the economy.[1]

The relationship between the managing agency and the managed company is a contractual one by which the agents undertake to conduct the business of the company in return for certain remuneration. The contract is usually for a minimum of ten years and often for much longer. The wording is usually such as to assure the agents of permanent tenure barring malfeasance or failure of the company. The remuneration usually consists of a nominal allowance for office expenses plus a commission of a certain percentage of profits. Prior to 1936, the commission might have been based on sales or production, but an amendment to the Indian Companies Act in that year specified that in all future contracts commissions should be related to profits.[2] The amount of the agent's commission varies between companies but it is not unusual for an agency to be paid 10 per cent of gross profits before taxes, as happens for example, with the Orient Paper Mills.[3]

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[1] For a detailed and thoughtful discussion of proposed changes in the statutory rights and limitations of managing agents see Government of India, Report of the Company Law Committee 1952, Delhi: Manager of Publications, 1952, Chap. X.

[2] Government of India, Ministry of Law. The Indian Companies Act, 1913 (7 of 1913), (as modified up to the 15th November 1951). Delhi: Manager of Publications, 1952, p. 40.

[3] Orient Paper Mills, Memorandum and Articles of Association, Calcutta: July, 1936, p. 25.

The extent of the powers delegated to the agent is suggested by the following extract from the Articles of Association of the India Paper Pulp Company:

> The Managing Agents shall, subject to the control of the Directors, conduct the business of the Company. They shall have the general management of its business transactions books, papers, effects, property, affairs, and concerns with full power to engage and dismiss managers, assistants, and all other officers and staff and all workmen and for the purposes of the Company to purchase and obtain all necessary machinery, stores, goods, and materials of any kind whatsoever and to sell such goods, machinery, stores, materials and/or any of the articles manufactured by the Company.[1]

The proviso "subject to the control of the Directors" offers the stockholders a potential rein over the activities of the managing agent. This rein, however, is not generally a very effective one since in most cases the Board of Directors is dominated by the agency, as will be explained later.

The number of firms managed by a particular agency may vary from one to as many as seventy. Two examples will illustrate the proliferation of business interests characteristic of the leading agencies. The organization managed by Birla Brothers lists itself as agent for forty-seven firms including: four textile companies, five sugar mills, seven landholding firms, two jute mills, three paper companies,[2] four engineering firms, two coal companies, and twenty other concerns, almost all of them in separate lines of endeavor. The Bird-Heilgers combination shows a somewhat greater concentration of interests among the sixty-seven firms for which it acts as agent. These firms comprise twenty-one coal companies, ten insurance companies, nine jute mills, six engineering companies, eight investment or trust companies, one paper firm, and twelve miscellaneous organizations. It is significant that paper making is only a secondary or tertiary interest even among the agencies which control the biggest mills.

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[1] India Paper Pulp Company, Articles of Association, Calcutta: June, 1933, p. 24.

[2] One of these three paper companies exists in name only and has no tangible assets.

Although the larger agencies appear to be engaged in a variety of unrelated industrial lines they do exhibit, among their subordinate firms, evidences of vertical and horizontal integration. Several of the agents who manage paper mills have found it expedient also to establish other subsidiaries to supply raw materials, to expedite fuel deliveries, or to handle the marketing of the products. Since these subsidiaries often serve only one or two firms it seems possible that the economies which they achieve relate at least as much to the diversion of profits and the reduction of taxes as they do to the cutting of purchasing or distribution expenses.

The important managing houses with interests in paper making are nearly all situated in Calcutta where they maintain most of their office establishment. In the division of functions between mill and head office, the latter generally handles all selling and financial transactions and may also take responsibility for some accounting, purchasing, and industrial relations matters. The leading agencies tend to be organized primarily along product lines so that most transactions are handled within, for example, the sugar, paper, or jute departments. In addition, certain functional departments, such as accounting or research and development, may overlap all product groupings.

Within the group of firms managed by a single agency certain paradoxical relationships can be seen to exist. This is especially true in cases where two, and oftentimes many more than two firms in the same industry and making similar products are found to be under the direction of one agency. In these circumstances the agent is obligated to foster the interests of each company as a separate entity although the welfare of each necessarily competes with that of the others. Since each managed firm has a different group of shareholders, it is impossible for the agent to distribute or to rationalize production, marketing, finance or any other phase of operations between the managed firms without favoring one group of shareholders at the expense of others. In interfirm relationships of this sort there are bound to be conflicts of interest over such matters as the employment of technological innovations, the specialization of functions, the geographical division of markets, the setting of prices, and the development of new products. Because of the separateness of ownership, the agency cannot treat each managed firm as if it were an integral part of a large corporate whole. Because of the unification of management it is virtually impossible for each firm to act as an independent competitor. The pattern of company behavior which results from this anomalous situation is not unlike that observed in a cartel.

Conflicts between the interests of shareholders of different managed companies are not limited to operations within a single industry, but may also arise as between companies in different but potentially competitive industries. For example, it is unlikely that a managing agency with heavy commitments in the jute industry would encourage the manufacture of multi-wall paper bags by a paper mill under its management. It can be shown further that a disharmony of interests may exist between all firms under one management, especially in the realm of finance. In situations where an agency must decide on the allocation of funds for expansion or renovation, it may base its decisions more on the size of its investments in particular firms than on the opportunities offered by market conditions. Alternatively an agency may commit its funds and its credit so heavily in one line of industrial endeavor that it has nothing left with which to exploit favorable conditions in another line. In defense of the managing agency form of organization it may be pointed out that diversification of corporate holdings results in the spreading of risks and makes possible the direct transfer of profits from one industrial sector to another. However, it cannot be stated with certainty whether such internal transfer of funds leads to a more or to a less effective allocation of investment finance than would the workings of the capital market.

Among the more evident characteristics of agency control and operation either within a single assemblage of managed firms or between firms under different managements is a relative absence of active competition. Within each agency group a modus vivendi is worked out which permits each company to enjoy its share of the common market. Similarly, in the larger context of the whole industrial scene there tends to be a live-and-let-live attitude. It is said that managing agents are sometimes reluctant to push whatever competitive advantage they may have in one industry for fear of retaliation by a rival agency in some other sector in which they are weak and vulnerable. Although the extent to which this latter statement holds true is uncertain, it does seem apparent that the stimulus of competition is somewhat restrained within the environment of managing agency operations.

In his book, The Structure of Competitive Industry[1], E.A.G. Robinson has discussed the advantages and the disadvantages of large-scale operation and has analyzed the question of what is the optimum size of firm on the basis of four principal criteria. If these four criteria (technical, managerial, financial, and marketing) are applied to the managing agency system, its economic functions are more easily evaluated. In this report, such analysis must be confined in its application to the paper industry since somewhat different inferences might be drawn, for example, in respect to tea gardens, coal mines, or insurance companies. In addition, certain assumptions as to the size of the agency and of the managed firm must be made since these considerations also have appreciable bearing on such an analysis.

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[1] Robinson, E.A.G., The Structure of Competitive Industry, London: Nisbet and Co., 1950.

Initially a medium sized (12,000 to 20,000 ton annual capacity) mill will be assumed, and the advantages to such a concern of operating within the framework of a relatively large agency, as contrasted with operating independently, will be assessed. In this example, it is also premised that the agency has no other paper mill interests. Taking first Professor Robinson's technical criterion, it can be seen that agency organization does not provide any technological economies of scale to a mill, since such economies depend not on the size of the company but on the scale of mill operations. Considering next the managerial criterion, it is apparent that through association with a managing agent the paper mill may realize certain economies of specialization in research, accounting, personnel administration, and perhaps other lines, which it would not otherwise enjoy. From the financial standpoint, there is little question but that the mill will benefit from its connection with an agency. Without the patronage of a managing agent it is virtually impossible in India to launch a new firm or to raise capital for an old one.[1] It is on this basis that advocates of the agency system make their strongest case. They also maintain that in the areas of marketing the agent is able to buy more cheaply and to sell more dearly than can the individual firm. In the case of a medium sized paper mill, this contention has questionable validity. On the buying side, such a mill is sufficiently large to achieve whatever economies there are in bulk purchasing. On the selling side, the organization of the market, as described in Chapter 6, is such that the agencies perform no services which cannot be carried out as cheaply by the mills themselves. The selling organization within an agency is usually broken down into functionally separate units so that, except in the smallest managing agencies, the overhead expense of selling paper cannot effectively be shared with that of, say, selling jute or sugar.

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[1] Large foreign firms with established reputations provide an exception to this generalization.

If, instead of a 12,000 to 20,000 ton unit, a very small paper mill is being considered, the advantages of working within the managing agency system are increased. This is especially true in respect to managerial and marketing economies. If, to take a third type of situation, two paper firms are managed by the same agent (as happens in three cases) appreciable savings may be realized through the spreading of overhead costs between the two firms. However, even greater savings of this nature could be achieved were these firms merged into a single, consolidated unit.

This last observation suggests the key question in the evaluation of the managing agency system. This question is whether the organization of firms under agency control is as efficient as the alternative of organization along functional and industrial lines as found in most of the more highly developed countries. The writer believes that the answer is strongly in the negative. There is felt to be little doubt but that a large and well run paper company, once established, would achieve not only the managerial and financial advantages claimed for managing agency operation, but substantial technical and marketing economies as well. It is believed further that unless a certain amount of unification and consolidation of paper firms along functional lines does take place, the full potential of this industry will not, and cannot, be realized in India. This contention will be discussed more fully in Chapter 11. Meanwhile it may be noted that, regardless of its shortcomings, the managing agency system will probably continue to dominate the industrial scene in India for many years to come.

The means by which the large managing agencies and their hosts of satellite firms are controlled by single individuals or by small groups is a subject around which a useful research project might be centered. Such recorded information as is to be found on this subject must be extracted in bits and pieces from the files of the state registrars of joint stock companies. The distribution of ownership among members of large families and the maintenance of control through the ability to vote shares held by "friends" are common features of managing agency proprietorship. Not uncommon is the use of investment or trust companies to extend the leverage of control. Taking the Titaghur Paper Mills as a case in point, in July, 1950 (the latest date for which records could be found) 33 per cent of the shares of this concern were held by two investment companies, Bird's Investments Limited, and Eastern Investments Limited. These two companies were in turn owned and managed by the Bird and Company - F. W. Heilgers agency. Possession of majority interests in this combined agency was vested in two trust companies and among members of one family. Ownership of the trust companies was held by three

British subjects living in the United Kingdom. Organizational control of this sort is believed to be not atypical of British managed concerns. Control in purely Indian agencies tends to be associated with large family groups and is therefore more difficult to trace.

The individual through whom a managing agency exercises its powers in a subordinate company is generally called the managing director of the company. Since the voting power of a director is determined by the number of shares he represents, the managing director is generally in a position to outvote all of the other directors. This situation frequently causes the latter to become mere figureheads or rubber stamps. They are selected more often on account of their influence in political or financial circles than because of their knowledge of industrial operations. Directorships, despite their limited powers and even more limited remuneration, do not tend to be broadly distributed. Rather they are conferred on a relatively small number of men, any one of whom may hold such title in a seemingly unlimited number of companies.[1] Among the directors of the India Paper Pulp Company in 1951, to cite a typical example, one man held thirty other directorships, another twenty-nine, a third held twenty-two, and the others from four to eight apiece. One of these directors was also a director of the Bengal Paper Mills while another had an equivalent position with the Titaghur Paper Mills. There being no laws in India against interlocking directorships among industrial concerns, the incidence of common directorships of firms in the same line of business is fairly high.

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[1] In 1948, one of the directors of the Titaghur Paper Mills Company, Limited, was also director of seventy-seven other concerns.

The common interests of the various paper mill managements and the need for interfirm cooperation in meeting certain problems have resulted in the formation of two manufacturers associations, known respectively as the Indian Paper Makers Association and the Indian Paper Mills Association. The Paper Makers Association dates back more than half a century and counts among its members all of the older mills. It is affiliated with the traditionally British Bengal Chamber of Commerce and is dominated by British managed firms. It is said that during several periods prior to 1933 this group engaged in activities to restrict production and to share markets, but that such practices have been generally shunned in more recent years. The rival Indian Paper Mills Association was founded in 1939 by managements of several of the newer firms.[1] Belonging to the Indian National Chamber of Commerce its membership is exclusively Indian, although several of its constituents also belong to the Paper Makers group.

At the present time, both associations exist for the primary purpose of dealing with the Government on matters which affect the industry. Bargaining with a common foe, the two groups find themselves in close accord and appear to be quite effective in apprising officialdom of the problems and needs of the paper mills. In view of the omnipresence of government regulation and control, such semi-political activity on the part of the associations appears essential to the health of their industry. Apart from this activity, the associations do very little to advance the cause of Indian paper making. They do not keep records, compile statistics, engage in technical or market research, attempt to standardize products, sponsor trade shows, or keep members informed about the over-all condition of the trade. They do none of these things although all of them could well be done to the benefit of the industry and, except for research-type activities, could be performed on a modest budget.

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[1] The following excerpt from the Report and Accounts of the Star Paper Mills Limited for September, 1939, (p. 6), is suggestive of the purposes for which this organization was founded:

> "The Directors are glad to inform you that during the period under review a new Association of the Indian Paper Mills was formed and at its meeting held on the 24th ultimo it was unanimously decided by all the members to sell paper at such prices and terms as are fixed by the Association from time to time. Serious competition among the Indian Paper Mills themselves should therefore be eliminated."

What has been said thus far about industrial organization as related to the paper industry applies most particularly to the more important mills and to the larger managing agencies. Statements concerning interfirm relationships, degrees of integration, and systems of control must be qualified considerably if they are to apply to the small, marginal units as well as to the large ones. Since the handful of very small mills plays a relatively unimportant part in the Indian paper making world, no further discussion will be given to the organization and management of such mills. A few comments should, however, be inserted concerning the three mills managed by state governments.

These mills operate without the benefit (or burden) of managing agents, performing for themselves such functions as purchasing, sales, accounting, and personnel administration. They are each guided by a managing director, a civil servant appointed by the state for a limited term. This functionary is responsible in one case to a board of directors, in another to the state Director of Industries and Commerce. Major managerial decisions are made by high state officials and tend to involve political as well as industrial considerations. Frequent and thorough checking of mill transactions by state auditors probably serves to discourage dishonesty but also succeeds in undermining managerial initiative. The only paper concern which has achieved a modicum of success under government operation is the Mysore Paper Mills Limited. This firm is a product of the so-called "Mysore Government Pattern"[1] under which the state of Mysore has assumed the roles of entrepreneur, managing agent, and shareholder. Although its shareholdings amount to only 10 per cent of the total for the company, the state government appoints both the chairman of the board of directors and the managing director. The company has generally shown modest profits on the production of a very good quality of paper, but its high operating costs and its inability to carry out a much needed expansion scheme without a large government loan suggest that it would have trouble surviving in a really competitive market.

In the field of industrial organization, the Government's role as manager is of less importance than its function as regulator. The authority under which it acts in this latter capacity is based on a number of statutes and orders, the most significant of which are the Indian Companies Act,[1] and the Industries (Development and Regulation) Act.[2] The Indian Companies Act is essentially a book of rules which sets the legal limits within which firms must operate. It defines the rights and obligations of shareholders, directors, managing agents, and liquidators, and gives the courts the necessary powers to enforce these rules. By current American standards, this act is a relatively laissez faire type statute, which permits firms to operate in comparative freedom and with a remarkable degree of secrecy.

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[1] Balakrishnan, P.R., "India's Paper Industry Today", Commerce, (Annual Review Number), Bombay: December, 1951, p. 1086.

By contrast, the Industries (Development and Regulation) Act, 1951, empowers the Government to intervene in many of the most fundamental aspects of the management of private concerns. Under this act, it is illegal in any of forty-two scheduled industries to: (a) "establish any new industrial undertaking," (b) "manufacture any new article," (c) "effect any substantial expansion of an industrial undertaking," or (d) "change the location of the whole or any part of an industrial undertaking," without first receiving a license to do so by the Central Government. Since the scheduled industries include every medium or large-scale manufacturing operation in the country, this puts a considerable burden of investigative work as well as of decision making responsibility on the licensing authorities. The Government is also empowered under the act to investigate

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1. The Indian Companies Act, op. cit., pp. 1-178.

2. The Industries (Development and Regulation) Act, op. cit.

any scheduled industrial undertaking in which there are unjustified price rises or declines in quality or output. On the basis of such investigations, the authorities may, if they see fit, set output standards and otherwise regulate production, control prices, and supervise distribution for the undertaking in question. In extreme cases the central authorities may go so far as to take over the management of a badly run concern. A further function allocated to the Government under this statute is the establishment of Development Councils whose objective is to increase the productivity of firms in each of the scheduled industries.

Except in respect to licensing provisions, this legislation has not been extensively implemented by administrative activity during the first two years of its existence. Its primary aim is that of facilitating and guiding the industrial development of the country, but its provisions are scarcely of a nature to give encouragement to individual initiative and private enterprise. Although from reading this statute one might well receive the impression that India is tending towards an increasingly socialized economy, the actual trend since independence has been towards greater emphasis on the performance of the private sector. By gradual stages the Government has come to recognize the importance of private industry's contribution to the national welfare, but it is by no means prepared to concede that industrial development will proceed as satisfactorily under individual initiative as under official guidance.

Most of the changes which have taken place in Indian industrial management over the past two decades have been in response either to government pressure or to the changed business climate resulting from British withdrawal from the country. Although the termination of the British Raj caused many nationals of that country to sell their business holdings to Indians, this transition of authority did not change the ownership and control of any paper mills or of their managing agents. What it did appear to do was to accentuate the already conservative tendencies of the British run companies and to cause them to stand still at a time when they should have been expanding. While these British mills waited to see which way the political currents were running, several Indian owned mills began on programs of postwar expansion and renovation. A number of Indian managers and technicians visited North America where they became acquainted with recent innovations in paper making and where they acquired an appreciation of the advantages of large-scale production. On their return to India they began to advocate changes of both a technical and a managerial nature. As might be expected, the technical recommendations found more ready acceptance than did the managerial. The three most progressive firms (Orient, Shree Gopal, and Rohtas) have all undertaken large-scale expansion and modernization programs but none has yet reorganized its management to a comparable extent. Although there is an increasing awareness of the usefulness of such organizational functions as cost accounting, personnel administration, and the use of staff specialists, it will probably be some years before these aspects of Western industrial management have been absorbed and adapted to the needs of the Indian paper manufacturers. Meanwhile the largest paper mill in the country will continue to operate without benefit of cost accounting and several of the major managing agencies will persist as family type organizations run on small shop principles.

Differences between Eastern and Western business attitudes and practices can also be seen in the field of industrial finance. As pointed out by a recent mission of the International Monetary Fund:

> The institutional arrangements for financing private industrial enterprise in India are not adequate. . .The reason is that the limited industrial sector cannot provide enough savings out of business profits to finance industrial expansion even on a modest scale. At the same time, the capital markets are not designed to finance the expansion of small and moderate sized businesses.[1]

In general, these statements hold true for paper making as well as for other industrial lines, although, as will be seen, certain of the more prosperous firms do not appear to have suffered in recent years from lack of investment capital. Something of the nature of the capital structure of the paper industry is indicated by a summary taken from the balance sheets of thirteen firms for 1952-1953.[2] This summary shows a paid-up investment total of Rs. 73,500,000 divided as follows: 24 per cent debentures, 19 per cent preferred shares, and 57 per cent common or ordinary shares.[3] Whereas the combined figures show a rather conventional distribution of debt and equities, the capital structure of individual companies exhibits wide variations. The India Paper Pulp Company, for example, has its capital represented 100 per cent by ordinary shares, while at the opposite extreme, the Orient Paper Mills shows the remarkable pattern of 45 per cent debentures, 36 per cent preference shares, and a mere 19 per cent of ordinary shares. Seven of the firms make no use of long term debt capital and five have no preferred shares.

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[1] Bernstein, E.M. and others, Economic Development with Stability, Government of India, Ministry of Finance, New Delhi, 1954.

[2] This summary includes all but two of the firms producing more than 2000 tons per year. The most significant omission in this and other financial tabulations of the paper industry is Rohtas Industries. This firm lumps together on one balance sheet figures relating to sugar, paper, cement, chemical, and other manufactures thus concealing from the public eye the true state of any one of these manufacturing lines.

[3] Included in the figure for ordinary shares is a fraction of a percentage of deferred shares. These are common shares of low par

In the past two or three years the capital market has shown a distinct preference for fixed return investments as opposed to ordinary shares. This is in part attributable to the laws governing the investments of insurance companies and of the recently established industrial provident funds.[1] The investing public, which has available to it only the most fragmentary information on the financial status of companies, has tended to follow the lead of these institutional investors. The Orient Paper Mills, as noted above, has taken full advantage of this public willingness to purchase bonds and preferred shares and has thus obtained all of the development capital it has required without diluting the ownership of the existing ordinary shareholders. The assumption by this company of such a large burden

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value which are not paid dividends until after the ordinary shares have received a substantial return. Because the deferred shares are cheap and yet have equal voting rights with ordinary shares, they have often been used in the past by managing agents as devices for controlling companies. They are little used at present and will probably be made illegal in the next revision of the Indian Companies Act.

[1] The conservative behavior of the investing public may also have been caused by the collapse of the share market in 1947.

of fixed return obligations involves less risk to the owners than might at first glance be supposed. With possibly the lowest operating costs of any indigenous firm, with a government guaranteed market for its products, and with paper prices officially set at levels to insure a profit, the Orient mill runs little danger of not being able to meet its obligations. Few other mills enjoy such a strong economic position and a majority of them, including all of the smaller units, suffer from a constant condition of financial anemia.

The Central Government has tried to relieve this situation by making loans to selected mills through the recently created Industrial Finance Corporation. Additional funds have been made available by the governments of the states of Hyderabad and Madhya Pradesh to assist private interests in establishing and expanding mills in those states. This official assistance has been of undeniable value in promoting the expansion of mill capacity but even with such fillips from the public treasuries, the market for capital as seen by the paper industry is a tight one indeed.[1]

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[1] The industrial finance situation may be improved measurably in the near future as a result of the operations of the new Industrial Credit and Investment Corporation of India. This organization, whose establishment was announced in late November, 1954, will be owned by private capital from India, Great Britain, and the United States, and will be aided by loans from the Government of India and the International Bank for Reconstruction and Development. It is said that the I.C.I.C.I. will furnish loans and technical assistance to industry, as well as making equity investments and underwriting securities. Its advent at this time should be propitious to the expansion of the paper industry. See New York Times, November 28, 1954, Sec. 3, p. 1.

The raising of short term capital presents less of a problem to the paper companies than does the marketing of debentures and equities. The banking system appears quite ready to loan the mills such working funds as they require against the security of raw material and finished product stocks. The availability of capital on these terms has encouraged two of the paper manufacturers to keep their plants and their inventories perpetually mortgaged and thus to obtain considerable funds not otherwise available to them.[1] A few of the companies still derive a portion of their capital from the deposits of individuals who loan money to the firms in return for a fixed rate of interest. Deposit finance has a long history in India but it is used less today than formerly and less by the large than the small firms. Its chief shortcomings are that the depositors may demand their funds back at any time and that they are most likely to do so at a time of financial crisis for the firm.

Analysis of the balance sheets and of the profit and loss statements of six leading paper makers[2] between 1940-1941 and 1952-1953 shows that the financial structure and behavior of these firms is more notable for its diversity than for its conformity to any pattern.

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1. To insure the safety of their loans the banks station representatives at the mills who hold the keys to the godowns (warehouses) in which the finished paper is stored. In this way the bankers are able to keep control of all (or almost all) of the mill's production. Occasionally, it is rumored, trucks back up to the end of the production lines during the midnight shift and remove some of the night's production without disturbing the bank's representative.

2. These firms (Titaghur, Bengal, India Paper Pulp, Orient, Shree Gopal, and Star Paper Mills) accounted for 78 per cent of Indian paper production in 1940 and for 72 per cent in 1952.

Common external economic circumstances have not engendered common responses by the managements of these six companies, although in general, the three British managed firms, Titaghur, Bengal, and India Paper Pulp,[1] have followed more conservative policies than have the three Indian units.

During the thirteen years from 1940-1941 through 1952-1953 the paper industry was extremely profitable. All of the mills made money, all paid out dividends, and all of them returned appreciable shares of their respective incomes to the Government in the form of taxes.[2]

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[1] These three firms are all registered in India with rupee capital. A majority of their stockholders and of their supervisory employees are Indian but top management and ultimate control still rests in British hands. Their policies and outlooks set them distinctly apart from Indian managed firms and justify the British appellation. There is one other British controlled company, the Punalur Paper Mills Limited, in Travancore-Cochin. This firm is not, however, bracketed with the other three, since its size, location, and type of products (mostly wrapping papers) cause it to follow different policies and practices.

[2] The structure and composition of taxes on corporate income and profits during the period in question is far too complex to be explained adequately in a footnote. Its basic elements at the present time are a company income tax and a supertax, each of which are flat rate levies whose incidence is fixed in the annual finance act. In addition, there is tacked on to the first of these a surcharge of 5 per cent of the normal rate on total taxable income. In 1953, the income tax rate (including surcharge) stood at 26.25 per cent and the supertax rate amounted to 29.7 per cent of total taxable income. However, both of these levies were subject to substantial rebates depending on such factors as the size and the dividend distribution policy of the company being taxed.

During the war years an excess profits tax whose incidence reached a peak of 62 per cent was imposed. This tax was replaced by a business profits tax in 1946 but the latter was abolished in 1949. A capital gains tax was also introduced in 1946 but it remained in effect for only two years. For further discussion of corporate taxes see Investment in India, op. cit., Chap. 5, and United Nations, Department of Economic Affairs, Public Finance Surveys, India, The rates at which they did these things, however, varied considerably as between mills and as between time periods. In this discussion, three time periods are distinguished: (a) the five war years, 1940-1941 through 1944-1945; (b) the five years of postwar adjustment, 1945-1946 through 1949-1950; and (c) the first three years of the nineteen fifties, 1950-1951 through 1952-1953.

Profits for the paper makers were highest during the war years and lowest in the postwar era. Taxes took almost 65 per cent of Titaghur's wartime gross earnings but only 28 per cent of those of the less prosperous Star Mills. The Orient Mills managed by some unexplained means to make profits comparable to those of the more successful firms without having to part with comparable tax payments. The proportion of gross profits (after taxes but before depreciation) paid out by Shree Gopal and Titaghur in the form of dividends was between 30 and 40 per cent in all three periods. Other mills showed wider variations, the smaller units tending to retain less of their profits than the larger firms. During the postwar years the three British firms upped their dividend rates appreciably relative to their profits. This may or may not have been in response to fears that nationalization of the industry was imminent. The total of income and profits taxes paid into the Central Government during the decade of the 1940's by these six mills was more than Rs. 88 million, a figure almost three times as large as the sum of dividends paid out.

New York: 1951, pp. 40-42 and 48-50. See also Government of India, Ministry of Law, the Indian Income Tax Act, 1922 (11 of 1922), (as modified up to April 1, 1951), Delhi: Manager of Publications, 1951.

The record of allocations for depreciation reveals that for most of the paper firms depreciation allowances were tied more closely to rates of profit than to any systematic formula for estimating the anticipated life of plant and equipment. Somewhat greater uniformity in the determination of depreciation allowances has resulted in recent years from the application of standard exemptions under the income tax laws.[1]

More significant than depreciation figures in evaluating the financial performance of companies are data on relative and absolute amounts of profits retained in the business. During the war period it was the Titaghur Mills which ploughed back the highest proportion

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[1] In order to stimulate new investment in the industrial sector, the Government has liberalized the Income Tax Act so as to permit companies to take large deductions against taxable income for depreciation of plant and equipment. In addition to normal depreciation rates specified for various types of buildings and machinery, special allowances have been granted since April, 1949: (a) for multiple shift operation, (b) for initial depreciation on new or unused plant and equipment, and (c) as a bonus on new facilities installed between April, 1948 and March, 1959.

Thus any paper mill installing new equipment after April, 1949, has been able to make the following deductions (shown as percentages of the written down value of the asset) from its taxable income:

Normal depreciation	10 per cent (yearly)
Triple shift operation	10 per cent (for first 5 years)
Initial depreciation	20 per cent (first year only)
Additional depreciation	10 per cent (for first 5 years)

As an added advantage, these allowances may be carried forward indefinitely until utilized, if net income is insufficient to absorb them in the applicable year. However, depreciation may not exceed original cost of facilities. *Investment in India*, *op. cit.*, pp. 44-45 and 156-158; and *Indian Income Tax Act*, *op. cit.*, pp. 20-21.

of its profits (nearly 70 per cent) while in recent years it has been Orient which has tended to retain the largest share (78 per cent). Such retention of earnings has enabled both companies to reward their ordinary shareholders handsomely by capitalizing accumulated reserves and by distributing the new shares as bonuses. Needless to say, the records of these two companies form exceptions to the general statement of the International Monetary Fund Mission that the industrial sector cannot provide enough savings to finance expansion even on a modest scale. It is significant, however, that such exceptions can be claimed for only the four or five largest firms in the industry.

A further indication of the comparative financial performance of the six paper firms whose records were studied is given by data on gross profits per ton. During the war period such profits ranged from Rs. 197 to Rs. 394 per ton before taxes and from Rs. 93 to Rs. 140 per ton after taxes. As would be expected, net profits were appreciably lower than the latter figures owing to depreciation deductions on much relatively new equipment. An over-all decline in revenues in the postwar period was partially offset by tax reductions, but the earnings of the smaller mills suffered sharply. Since 1950 profits have risen markedly for the two leading Indian managed mills and to a lesser extent for the others. The average gross profit after taxes for Shree Gopal and Orient during the first three years of the nineteen fifties was in the vicinity of Rs. 240 per ton. Comparable profits for the Bengal and Star mills were less than one-half of that figure, while those of Titaghur were around Rs. 190 per ton. Average gross profits before taxes for this latter period were from 25 to 55 per cent higher than the post-tax figures, the level depending on the profitability of the company. In evaluating all of these profits it is well to remember that the general price level rose almost 300 per cent in India between 1939 and 1952. Unfortunately, available data do not permit a more specific statement as to what has happened to paper mill profits in terms of real value between the prewar era and the current period.

The profits declared by Indian firms in their financial statements do not have quite the same meaning as do the equivalent figures in the statements of Western firms. The major difference is attributable to the payments going to the managing agents. These may take the form not only of percentage cuts on profits, as previously noted, but also of commissions on sales and purchases, and of contributions to the managing agent's overhead costs. All such payments to the agent are deducted before calculating the profit of a managed company. It is true that much of this remuneration represents the legitimate cost of managerial and other services but there is reason to believe that a significant portion of it belongs in the category of profits.

A comparison of managing agency remuneration (as officially tagged in the profit and loss statements) with dividends going to shareholders shows the former to have declined relative to the latter in recent years. During the war period the return to the managers was 64 per cent of that going to the owners.[1] In both of the periods analyzed since 1945, that proportion was down to 47 per cent. This changed relationship is attributable to the declining incidence of corporate taxes and to the fact that agency remuneration was calculated before taxes, while the return to ownership was based on the balance remaining after paying the Government.

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[1] It may be noted that since the managing agents are generally the largest single shareholders in the companies which they direct, their total compensation includes, in addition to commission and allowances, a substantial proportion of the dividends paid on the common shares of those companies.

No appraisal of industrial organization and finance in India can be considered complete without some mention of business ethics and morality in that country. This is a subject on which there is a surfeit of rumor and opinion and a paucity of documented information. The writer was apprized repeatedly of the duplicity and malfeasance of local businessmen both within and outside of the paper industry but was not given evidence to substantiate such charges. Accusing fingers were most often pointed to members of the Marwari community,[1] the usual indictments being for black marketing, tax evasion, irresponsible speculation, the keeping of fraudulent accounts, and the exploiting of a seller's market with products of inferior quality. Whether or not a substantial proportion of Indian merchants and industrialists actually do keep two sets of books, refuse to honor commitments, and take pride in defrauding the Government of legitimate revenues, such behavior is certainly attributed to them by a large number of people. Some of the consequences of this widespread mistrust of the nation's business interests are seen in the reluctance of capital owners to invest in industrial equities; in the excessive time and money which are devoted to the checking and inspection of goods and records; and in the slowness of commercial transactions due to unwillingness to grant credit and inability to act on verbal agreements. Also affected by this widely accepted stereotype of business behavior are public policies toward regulation and nationalization of industry, and labor attitudes towards employers. Popular suspicion does not extend in comparable degree to foreign firms operating in India, and the relatively more favorable reputations held by these latter firms are distinct business assets to them.

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[1] The Marwaris are a Hindu community whose traditional occupation has been moneylending. Originating in the Marwar area of the State of Rajasthan, this community has spread to many other parts of India and is today the most dynamic, and possibly also the most important, business group in India. The Birla, Dalmia-Jain, and Bajoria families are all Marwaris. Mills managed by them include Orient, Sirpur, Rohtas, and Star.

In discussing business behavior, in India as elsewhere, it is probably well to remind oneself that economic expansion has often been carried out by imperfect men and that it is not necessarily incompatible with questionable business practices. It may be added, furthermore, that there is evidence today among the more dynamic business elements of a shift away from the traditional methods and attitudes of the speculative trader and towards behavior of a more responsible sort. Public sentiment, government pressure, and the demands of their expanding enterprises seem to be forcing business leaders to take a more long-range point of view.[1] However, even if this new approach should triumph over the old ways, it appears unlikely that private enterprise will vindicate itself in the eyes of the general public for some years to come.

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[1] One of the recommendations of the Shroff Committee which was appointed by the Government of India in 1953 to report on finance for the private sector under the Five Year Plan gave official recognition to this problem. It made a plea to business and

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industrial groups to enforce proper codes of conduct and to raise standards of business morality and management. "Progress of India's Five Year Plan," The Times (London) Weekly Review, August 12, 1954, p. vi.

CHAPTER 6

Marketing and Pricing

An important aspect of the paper industry which has not been discussed in the preceding chapters is the distribution to consumers of the finished products of this industry. An exposition of this highly significant final step in paper making operations, including the organization of the market, the setting of prices, the sales policies of the major producers, and the exclusion of foreign competition is given in the following pages.

An approximate breakdown of the 1953 production total of just under 139,000 tons into its major components is as follows:[1]

Printings and writings	69.0%
Wrappings	15.5%
Paperboards	13.5%
Special varieties	2.0%

A more detailed listing of the production of various grades and classes of papers had not been drawn up when the field work for this study was completed but certain estimates may be made in respect to further subdivisions. The separation between printing and writing papers is not a sharp one, since the same grade of paper may be used for both purposes, but it would not be far from the truth to assume that each grade contributed about one-half to their combined total. In the case of wrapping papers, close to 65 per cent were classed as krafts or imitation krafts, with the balance made up of low grade brown papers. Output of boards consisted of an estimated 42 per cent duplex and triplex (mostly used for railway tickets), 43 per cent pulp boards (for boxes), and 15 per cent other boards.[1] Details for special varieties were not available. It will be recalled that the total value of sales of domestically made paper in 1953, as calculated in Chapter 1, was 187 million rupees.

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[1] Government of India, Ministry of Commerce and Industry, Directorate of Industrial Statistics, Monthly Statistics of the Production of Selected Industries in India, Calcutta: January, 1954, p. 16. Percentage figures for the various categories are based on data for the first eight months of 1953 only.

The principal consumer of Indian paper is the Government, with annual orders amounting to about 40 per cent of all output. Second to Government are printers and publishers who purchase the bulk of the cultural papers (printing and writing) entering the civil market. Other proportionately large users of printing papers are the tea, match, and soap industries which require this grade for labeling their products. The leading consumers of wrapping papers are textile, shoe, and match makers, while purchases of paperboard come primarily from the railways and from the manufacturers of cigarettes and of paper boxes. The export market for Indian made paper is extremely small and, except for a brief period from 1937 to 1941, it has never accounted for as much as 2 per cent of domestic production. For annual export tonnage figures since 1937, please see Appendix IIA.

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[1] Approximations are based on figures obtained from the Planning Commission, April 1954.

The variety of papers manufactured is relatively wide, especially in the field of writings and printings. A majority of the firms have sample books or price lists indicating production during the year of from twelve to thirty-two varieties. Many of these grades of paper differ from one another only slightly, in color, finish, or content, yet each requires separate handling from the pulp stage in the manufacturing process until it reaches the final consumer. Further variations in specifications are provided by a wide choice in sizes plus a limited range in weights of papers produced. In this matter of weight or thickness of sheet, the mills show more uniformity than in other respects. Operating in a protected market and under an industrywide pricing system in which payment is determined on a poundage basis, most of the firms have minimized their output of thin papers in recent years. They have done so because they have been able to make more paper per machine hour by manufacturing only the heavier varieties, and because consumers, with no alternative available to them have had to accept the thicker and consequently more expensive grades.

From the point of view of quality it is widely agreed that Indian made paper cannot stand comparison with the equivalent European or American product.[1] Just how great are the differences in quality between Indian and Western papers is partly a matter of judgment and partly a question of which mill's products are sampled. The Indian industry has not yet established product standards. Consequently there are wide variations in appearance, uniformity, strength, and other properties between the papers of different mills. It was agreed by almost all of the merchants with whom the writer spoke, as well as by most mill representatives, that the British directed concerns had maintained higher and more consistent quality standards than had the Indian managed firms. Even among these three companies, however, levels of quality in 1953 which represented distinct advances over wartime and immediate postwar standards, were said to be appreciably below those which had prevailed in 1938 and 1939. The failure of the industry to improve the quality of its output would seem to be explicable chiefly in terms of: (a) an absence of serious competition either from imports or between the major producers, and (b) price ceilings which eliminate the incentive to raise standards so long as the larger mills can sell all that they can produce. In the case of some of the smaller and more inefficient units, it is probable that, with their high operating costs and their crude methods, they actually cannot produce a really good paper which they can afford to sell at current prices.

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[1] In early 1954, the Presidents of the All India Printer's Conference and of the Paper Traders Association, Bombay, made strong public criticisms of the nation's paper mills for the latter's failure to produce paper of acceptable quality. Speech of the Chairman of the Indian Paper Makers Association, as reported in the The Statesman, April 23, 1954, p. 5.

The distribution of paper from mill to consumer can be said to follow three main channels: (a) sales to the Government, (b) direct sales to large consumers, and (c) sales to distributors. The Government has first call on mill supplies and, as previously mentioned, it takes about 40 per cent of annual output. This percentage is not uniform for all producers but varies between 30 per cent, from the larger mills, and 100 per cent in the case of one of the small, marginal units. The Director General of Supplies of the Central Government decides which kinds of paper each mill can best supply and allocates mill quotas for departments of both the Central and state governments.

To the more marginal firms, government orders are a salvation. Without such assured consumption of 60 per cent or more of their output, several of these units would be out of business, since there is little popular demand for the grades of paper which they produce. By contrast, the larger firms fret at having to sell one-third of their output for appreciably less than they could get for it in the civilian market, although they enjoy the security which they get from steady official requisitions. These differing attitudes toward government orders point to the fact that while there is a continuing shortage of good quality paper in India, there is a concurrent excess capacity in the production of inferior grades. With government prices standard for all mills, the allocation of Central and state orders tends to be on a regional basis--the former system of competitive bidding having been eliminated during World War II. Under the present system, mills situated within the borders of certain states are assured of preferential treatment in the placing of orders by those states.

Consumers, other than the Government, to whom direct sales are made, are the half dozen or so largest individual customers with whom each of the mills deals. Sales of this sort make up a relatively small proportion of distribution, since for most of their business, the mills prefer to deal through their distributors. The distributors are by-passed for customers who provide large, sustained orders such as the cigarette, shoe, and box manufacturers referred to above. They are frequently dispensed with also in sales between the British mills and certain other European managed firms, and in transactions which take place within a managing agency group of companies. Terms granted to direct consumers are sometimes as favorable as those allowed to distributors but are more often a compromise between distributor's buying and selling prices.

As intimated above, the usual channel for marketing paper is through distributors and dealers. Since the line between wholesale and retail trade is not sharply drawn, one firm may act in both capacities and be a stationery manufacturer besides. Distributors are often joint family, proprietary concerns which have enjoyed longstanding relationships with their suppliers. Except in the largest cities, they tend to deal exclusively in the products of one concern, although they may be permitted to carry other noncompeting goods, including imported papers. The very exclusiveness of this distribution channel puts the mills under obligation to supply to their dealers and distributors a wide variety of grades and sizes as demanded by consumers, thus ruling out specialization in a few manufacturing lines.

The market area of each distributor is usually clearly defined by the mill, and it is understood that no sales will be made outside of that area. As might be expected, this understanding is not always adhered to, particularly when shortages exist in one area and surpluses in another. In the cities of Delhi, Calcutta, and Bombay, market practices are somewhat different. For each paper manufacturer there are one or more large distributors and a host of dealers. Competition is much more effective, and exclusive dealerships have to make way for sales outlets which carry a wider variety of papers.

Relationships between paper makers and paper sellers are quite similar in British and in Indian managed firms except in regard to matters of credit. For both types of mills, sales are handled through the managing agency's head office which, for all of the larger units, is located in Calcutta.[1] Indian firms sell mostly for cash but may give credit to regular customers who have placed security deposits with them. The British managed firms, on the other hand, operate on a dual system. In dealing with non-Indian firms and with their older Indian customers they follow the billing and credit systems generally accepted in Europe and America. In their relationships with customers who are less well established, they either insist on cash payments or deal through a bania who accepts credit risks for a 3 per cent fee.

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[1] The Mysore Paper Mill, having no managing agent, makes its sales direct from the mill--a procedure which, its officials contend, allows it to effect a substantial saving in administrative costs.

In Bombay, where the competition of imported paper has always been felt most keenly, a unique selling arrangement was worked out in 1933 by the four mills--Titaghur, Bengal, India Paper Pulp, and Deccan --then serving that market. The Indian-owned Deccan mill later dropped out, but the arrangement has continued for the three British managed firms under the name of the India Paper Sales Association. This organization has been responsible for the allocation and distribution of all of the paper sold by these three firms in the State of Bombay and in adjacent areas to the north. In the early nineteen-thirties the I.P.S.A. had a near monopoly of the domestic production entering that market area. More recently the share of indigenous paper sold by the Association in and around Bombay has probably been nearer 50 per cent, the balance being divided between approximately ten Indian firms. Currently the I.P.S.A. receives monthly quotas from each of the member mills and issues its allotment to its customers, also on a quota basis. The mills ship direct to the customers but payment and credit arrangements are all handled by the Association. Questions as to quantities to be supplied and shares of common selling expenses to be borne by each of the three firms are worked out by "amicable agreement." In the past there was a certain amount of cross-manufacturing, with one mill making paper for another under the latter's label. This practice has been discontinued, but the virtual assigning of particular customers to the products of specific mills continues. The Association is able to act as the impartial agent of all three mills since the market has been stabilized between them, and it is not obligated to push any one product at the expense of others.

Because of the paper shortage which, except for a few brief interruptions, has persisted since 1940, all of the mills making better quality papers follow a system of granting quotas to their dealers. This quota system gives the manufacturers a means of controlling distributors as long as the seller's market persists. It also deters the distributors from complaining too loudly about the quality of the paper they are receiving. Almost all mill production is made against orders, which take about three months to fill. The mills carry only the barest minimum of finished paper stocks, leaving this function to the distributors and retail dealers.

The pricing system for paper which has been followed since 1950 is an outgrowth of the previous decade of government price controls. Although those controls were officially abandoned in May and June of 1950, the market was not thereby set free to establish its own equilibrium prices. Instead, a "freely negotiated contract" has been drawn up each year since 1950 between the Government and representatives of the Indian Paper Makers and the Indian Paper Mills Associations.[1] This contract specifies the prices which the Government will pay during the year for its orders and also, by virtue of a further "understanding" between the Government and the Associations, sets the price level in the civilian market. Prior to 1954 the manufacturers complained that prices were actually dictated by officials in New Delhi, who reputedly threatened to have official accountings of mill costs if government proposals were rejected. As of the current year, however, the bargaining relationship appears to have changed, as evidenced by these statements of the Chairman of the Paper Makers Association:

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[1] Indian Paper Makers Association, Report of the Committee 1951, op. cit., p. 11.

> I am glad to say that this contract [for 1954-1955] was concluded last week. . . . Even more important is the fact that Government have agreed with the industry that the unpleasant process of costing need only be resorted to, when there is such a wide disparity in the two parties ideas of price as to make further negotiations impossible. . . . What in effect has been achieved is settlement by "free negotiation" which, indeed, was always the intended basis of settlement for these annual contracts but which we had recently come to fear was no longer the case.[1]

What is referred to above as "the unpleasant process of costing" is a procedure which was begun in the winter of 1947-1948 when the Tariff Board did a cost analysis of six mills to determine what prices should be set for domestically made paper.[2] The method followed in this cost analysis was the one already described in Chapter 4. The final figures arrived at by the Tariff Board became the basis for a price structure which was utilized in all government paper orders.

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1. The Statesman (Calcutta), April 23, 1954, p. 5.

2. Report of the Indian Tariff Board on Paper Prices, op. cit., pp. 5-15.

The price of white printing papers was established as the key figure and all other prices were related to it by standard differentials.[1] This government price for white printing (f.o.b. mill) was set at Rs. 1161 per ton, effective October 1, 1948.

Prices for the civilian market were calculated in the 1948 Report by adding to the Government price 4 per cent for selling, distribution, and advertisement expenses, 8.5 per cent for distributor's discount, and Rs. 105 per ton (about 9 per cent) for outward railway freight. These increments are shown in tabular form below:[2]

Government price (white printing paper)	Rs. 1161 per ton
Selling expenses, 4 per cent	47
Distributor's discount, 8.5 per cent	99
Freight allowance	105
Civil market price (white printing paper)	Rs. 1412

As a result of increasing costs stemming from the Korean War situation, the government price for white printing paper advanced in October, 1951, to Rs. 1202. Concurrently the mill net price in the civilian market rose a modest 5 per cent to Rs. 1482, and certain changes were made in the mark-up pattern. Distributors were granted a 6 per cent discount with an extra 1.5 per cent off for prompt cash payment. Retail dealers were permitted (and supposed) to add an additional 7.5 per cent to the mill price, making a total distribution markup of 15 per cent.[1] This has remained the pattern agreed on by the paper associations but not always followed either by the mills or by the dealers. Several firms whose quality standards have assured them of a ready market have held to this pricing system and have been relatively successful in requiring their distributors to do the same. The pattern has been too rigid, however, to accommodate the variations in quality standards and in business policies that are to be found among all of the paper makers and traders. In consequence, a certain amount of shading has taken place. One mill has sold its products at the official prices but has tacked on freight charges, while absorbing into its sales revenue the Rs. 105 which had already been included for this purpose. Others, whose products have had less market acceptance, have quoted official prices but have given large discounts. Several concerns have related their policies to those of the Titaghur Paper Mills Company, Limited which, with its two mills and its 41,000 ton capacity, has long been the most influential firm in the industry. With Titaghur paper selling at Rs. 1482 per ton, one of the smaller mills figured that it could sell its product if it gave a discount of one anna per pound or Rs. 140 per ton.

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[1] Some further price flexibility was achieved by allowing marginal increments for coloring, rag content, special finishing, etc., ibid., p. 15.

[2] Ibid., p. 14.

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[1] This pattern is in striking contrast to that followed in the United States where "The 'suggested margin of profit' for the wholesale trade is generally around 20 to 25 per cent on the selling price; for the retail trade 40 per cent." Organization for European Economic Cooperation (hereinafter referred to as OEEC), The Pulp and Paper Industry in the U.S.A., Paris: 1951, p. 143.

The temptation to cut prices has always been greater for distributors and dealers than it has been for manufacturers. Operating on narrow margins, possessing limited reserves, and lacking a long range view of market conditions, the merchants have shown a susceptibility to pressures for rapid turnover of stocks and a readiness to drop prices to match those of their competitors. Being ill-equipped to compete through advertising, sales promotion, customer service or display techniques, they have periodically resorted to slashing their already restricted markups to increase their sales.

Far more frequent than price cutting in the recent history of the paper industry has been unofficial price raising to take advantage of recurring local shortages. During the preceding decade black marketing operations were reputed to have been rampant, with many mills as well as a host of merchants taking their shares of the illicit profits. However, by 1953 supply had begun to match demand at prevailing prices and black marketing activity had almost disappeared.

Among the many merchants, managers, and sales representatives with whom the question of price elasticity of demand was discussed, there were few who believed that price reductions would appreciably increase paper consumption.[1] Several of them suggested that lower prices would permit domestic products to displace some imported papers from their already restricted share of the market but they did not envision a larger share of the consumer rupee being spent on paper or paper products. Their feeling was that they were selling to a narrow market which was buying all of the paper that it required. It was explained to the writer that neither the small, literate middle class which used printing and writing papers, nor the industrial consumers of wrappers and paperboards would be persuaded to increase their demand for these products appreciably by a 10 to 20 per cent reduction in price. Opinion seemed to be unanimous in feeling that large-scale expansion in demand would only come with increasing literacy, growing industrialization, and enlarging per capita income. The targets of the Planning Commission for consumption and production during the period of the Five Year Plan have been widely accepted as representing supply-demand relationships through 1956. These targets predict an aggregate demand (exclusive of newsprint) of 200,000 tons by 1955-1956. This demand would be exactly matched by expected increases in domestic production.[1] These estimates, which were made in 1952, were markedly lower than those made by the Government Panel on Paper, Pulp, Board and Chemical Cotton Industries in 1947. Targets (exclusive of newsprint) set by the Panel for 1956 had been 322,000 tons for consumption and 312,000 tons for production.[2] The downward revision of expectations was necessitated by the fact that rates of economic development and of growth in literacy had been considerably slower than had been officially anticipated at the time of independence. It is doubtful if the paper makers had ever been quite so optimistic.

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[1] The Planning Commission did not concur in this opinion but went on record with the statement: "High prices have been largely responsible for restricting the demand for paper during the last several years." Programmes of Industrial Development, op. cit., p. 174.

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[1] The projected demand for newsprint in 1955-1956 is 100,000 tons. Ibid.

[2] Report of the Panel, Pulp, Board and Chemical Cotton Industries, op. cit., pp. 11 and 12.

The demand for paper today is primarily urban in nature since consumption for cultural and industrial purposes is much higher in cities and towns than it is in the rural areas. As noted in the previous chapter there are four principal market areas--North, South, East, and West--the centers of which are separated from one another by distances of from eight hundred to twelve hundred rail miles.[1] The approximate costs of shipping one ton of finished paper from Calcutta to each of the three other market centers are shown below, using the rates shown in Table VI of Chapter 3 and adding to each, twelve rupees for trucking and handling charges. These shipping costs are also shown as percentages of standard mill realizations on white printing paper so as to illustrate their relative importance.

Terminal Points	Mileage	Cost/ton	% of mill realization
Calcutta-Bombay	1100 mi.	Rs. 96	7.0%
Calcutta-Delhi	850	78	5.7
Calcutta-Madras	900	82	6.0

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[1] The cities of southern Uttar Pradesh form an exception to this pattern of separate markets since they may be considered to be in either the Calcutta or the Delhi selling areas.

It is evident from these figures that it is distinctly to the advantage of each mill to sell as much as possible of its production in its particular area. However, since no single region affords a wide enough market for any of the larger firms, these mills must sell their products in one or more of the other markets. The establishment of new mills in Central India has changed this situation somewhat, since these units have a freight cost advantage over other mills when selling to customers in three out of the four sales regions. A further change in marketing practices may result from the recent acquisition of two former state operated mills by the managing agents of the Orient and of the Shree Gopal Mills, respectively.[1] The coordination of the sales of pairs of separately located mills so as to minimize freight costs would be a step towards the rationalization of paper distribution on a national scale.

Division of markets for paper exists on production as well as on geographic lines. As noted at the beginning of the chapter, there are three major categories of paper which do not compete with one another. These are (a) printing and writing, (b) wrapping papers, and (c) paperboards. Additional noncompeting classes are cigarette papers, specialty papers, and newsprint. The last of these, imported newsprint, does actually compete to some extent with low grade printing papers since it can be made into a presentable looking, though short-lived sheet. Prior to 1953 imports of old newspapers constituted a major source of cheap wrapping paper and provided serious competition to indigenous production of this grade of paper. The competitive threat from this quarter has recently been eliminated, however, (as explained in a footnote later in this chapter), by the imposition of a very high duty.

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[1] For an explanation of this transition from public to private ownership, see Chapter 9.

In 1953, eleven of the mills made bleached printing and writing papers, nine or ten of them made wrapping papers, five produced boards, two produced specialty papers, and one made cigarette papers. In the categories of cultural papers, of low grade wrapping papers, and of cheap boards, there has been a certain amount of competition between producers. In the manufacture of better grade wrappings and paperboards, of specialty papers, and of cigarette tissue, the existence of competitive forces has scarcely been discernible.

What has been perhaps as effective a bar to competition as either product diversity or geographic distribution has been the attitude of many managements, especially those of the older firms. These latter have seemed to feel that as long as they receive sufficient orders to keep their mills operating at near capacity there is no very urgent need to improve their products, to book more orders, to expand their capacities, or to give better service. A more expansive policy has been followed by several of the newer mills which have continued to increase their outputs to meet growing demand and which have sought for themselves particular segments of the market in which they might enjoy dominant positions. Very few of the firms, however, appear to have been thinking in terms of increasing their share of the total market, of taking business away from other concerns, or of creating new demands where none had existed before.[1] In the absence of these competitive urges, the paper market has tended to be both stable and passive.

Faced with an almost continuous seller's market since 1940, the larger firms have been under little pressure to attract new customers or to please old ones. The types of salesmanship and customer services which are commonplace in America today are still very rare in India. A few of the paper firms do have outside salesmen who visit the bigger purchasers of their products, but the majority of producers depend on written correspondence for filling their order books. Having had dealings with their distributors over long periods, the manufacturers are prepared to rely on the initiative and judgment of these distributors in marketing matters. Not having made it a policy to deal directly with the majority of the industrial consumers of their products, they are unprepared to give the service and individual attention that modern industry expects. The manager of a chemical firm told the writer that although his company consumed more than 150 tons of paper and board each year, he never saw a salesman from an

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1. When asked why his mill had not increased its capacity in the face of rapidly growing demand, the managing director of one mill called attention to the Planning Commission's estimates of demand through 1955-1956 and to proposed expansions of other mills to meet this enlarged consumption. Since other concerns were already planning to supply these future needs, he reasoned, what market would there be for greater output from his mill?

Indian paper mill, and he encountered constant difficulties in getting local mills to meet specifications. He contrasted this approach with that of a Swedish paper concern which had recently sent a salesman half-way round the world to check on the special needs of its customers.

Budgets for advertising by the paper firms are very small. Only one concern spent more than Rs. 20,000 on this item during 1953 and most firms spent less than one-quarter of that. Queries on this subject were met with the explanations that the manufacturers already had all the orders they could handle or that consumer advertising was not likely to have much effect on the demand for a commodity such as paper. Such advertising as does take place is usually in the form of picture calendars sent out to distributors, supplemented by routine inserts in the trade journal, Indian Pulp and Paper. Despite limited funds for publicity purposes, the manufacturers have shown an awareness of the importance of brand consciousness in the sale of products that might otherwise be difficult to differentiate from one another. Popular symbols such as the elephant, the peacock, and the tiger are watermarked into many of the papers to distinguish them as the products of particular mills. Watermarked papers in general have a higher degree of market acceptance than do plain varieties so that most mills find it expedient to give their products this extra symbol of distinction. In contrast to the attention paid to watermarking is a virtual neglect of the use of effective packaging and labeling techniques.

Market research is another field to which little attention is given.[1] This type of activity is rarely carried on in any country in a systematic way except by large companies or by agencies specializing in it. It is doubtful whether any of the Indian paper makers is big enough to be able to afford a sustained market research program, yet there is a real need for work of this sort to be done. One job in particular which requires an initial investment in research before it can be accomplished is that of standardizing on sizes, grades, and finishes. There seems little doubt that substantial savings could be realized if the mills could restrict their output to a limited selection of papers of standardized qualities and dimensions. The extent to which the public is willing to exchange some freedom of choice for reductions in price needs to be explored.

Two external influences on the sale of paper which lie outside of the control of manufacturers are seasonality of demand and sales taxes. The principal seasons for printing and writing papers are associated with the academic and the accounting years. The printing of textbooks and of examination booklets on the one hand, and of ledgers and account books on the other, provide surges in the level of demand which occur at different times in different parts of the country.

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[1] One of the British managed firms spoke with some pride of its market research activities. Further questioning showed this research to consist of confidential reports on current sales and imports in the major markets. No work of an exploratory, testing, or sampling nature was being done at all.

The Indian business custom of always starting a new ledger at the beginning of the religious year assures the industry of big demand on that annual occasion. Seasonality also exists in the consumption of colored papers used for marriage festivities and of wrapping papers employed at Christmas time. These ups and downs in the demands for particular products are not so great as to cause major changes in production schedules. In many cases the mills find it possible to counterbalance them by work on government orders.

The problem faced by the paper companies in the matter of sales taxes has resulted from a recent ruling by the Supreme Court permitting the provinces to charge such taxes on interstate trade.[1] Following this decision there has ensued a situation in which provinces of origin and provinces of destination were both invoking their rights to levy the tax, while certain companies were insisting to each state that the transfer of ownership of goods took place in some other province. The level of taxes (from 1.6 to 4.7 per cent) and the conditions under which they may be levied have shown considerable divergence as between states. The outgrowth of all of this has been a confused legal and accounting tangle which may not be clarified until the Central Government intervenes to establish uniformity of rates and procedures.

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1. Bombay State v. United Motors (India) Limited. The writer did not have access to the original text of this decision but has utilized instead a summary of it appearing in the Hindusthan Standard, Economic Supplement, January 25, 1954, p. 8.

The intervention of the Government to help in the solution of various problems facing the industry has become an accepted practice. This was not always the case. Prior to 1925 the Government had taken a laissez-faire attitude towards the paper makers except in respect to giving them preference in the filling of its orders for paper. A change in this official attitude was reflected in the passage of the Bamboo Paper Industry Protection Act, of 1925, levying a protective duty of Rs. 140 per ton on imported printing and writing papers.[1] The act was passed with the avowed intent of encouraging the growth of a paper making industry utilizing bamboo as its primary raw material. It served also to give a measure of protection to any indigenous mill making writings and printings, whether from grass, woodpulp, or rags. An indication of the trends in tariff levies on imported paper and woodpulp since 1925 is shown in Table XII.

On the expiration of the original act in 1931, the tariff was renewed for seven more years and an additional surcharge, levied for revenue purposes, was tacked on, bringing the duty to Rs. 175 per ton. Protection was extended once again in 1938, at slightly reduced rates, and continued in effect until 1947. In that year the Tariff

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[1] A good, short summary of the tariff policy for paper is given in Government of India, Report of the Fiscal Commission 1949-1950 Delhi: Manager of Publications, Vol. I, pp. 62-64. For more detailed information see Reports of the Indian Tariff Board, op. cit., for 1925, 1931, 1938, and 1947 plus the records of the written and oral evidence heard on which these reports were based.

Board decided, despite the protests of the industry representatives, that protection was no longer required and recommended its termination.

TABLE XII

IMPORT DUTIES ON PAPER AND WOODPULP FOR SELECTED YEARS
1925 TO 1953(a)

Year	Printing and Writing Papers	Newsprint	Old Newspapers	Woodpulp
1925	Rs. 140/T(b) or 15%	15%	15%	not known
1932	Rs. 175/T or 18.7%	25%	25%	Rs. 56.2/T
1938	Rs. 126/T or 25%	30%	30%	Rs. 30/T
1947	30%	30%	30%	30%
1953	39.4%	Rs. 31-42/T	66.6%	18.9%

(a) Data for the years 1925 through 1947 were taken from *Report of the Fiscal Commission*, *op. cit.*, pp. 62-64 and *Report of the Indian Tariff Board, 1938*, *op. cit.*, pp. 1-7. Figures for 1953 were extracted from *Indian Customs Tariff*, July 1, 1953, *op. cit.*, p. 30.
(b) All percentage figures are *ad valorem* revenue duties. Where-ever a choice has been indicated, the higher rate is the one applied.

The Government complied with this proposal but saw fit to retain a 30 per cent *ad valorem* duty for revenue purposes. This revenue duty was increased to 37.5 per cent in 1949 and to 39.38 per cent in 1951.[1] The "deprotected" paper industry had never before enjoyed

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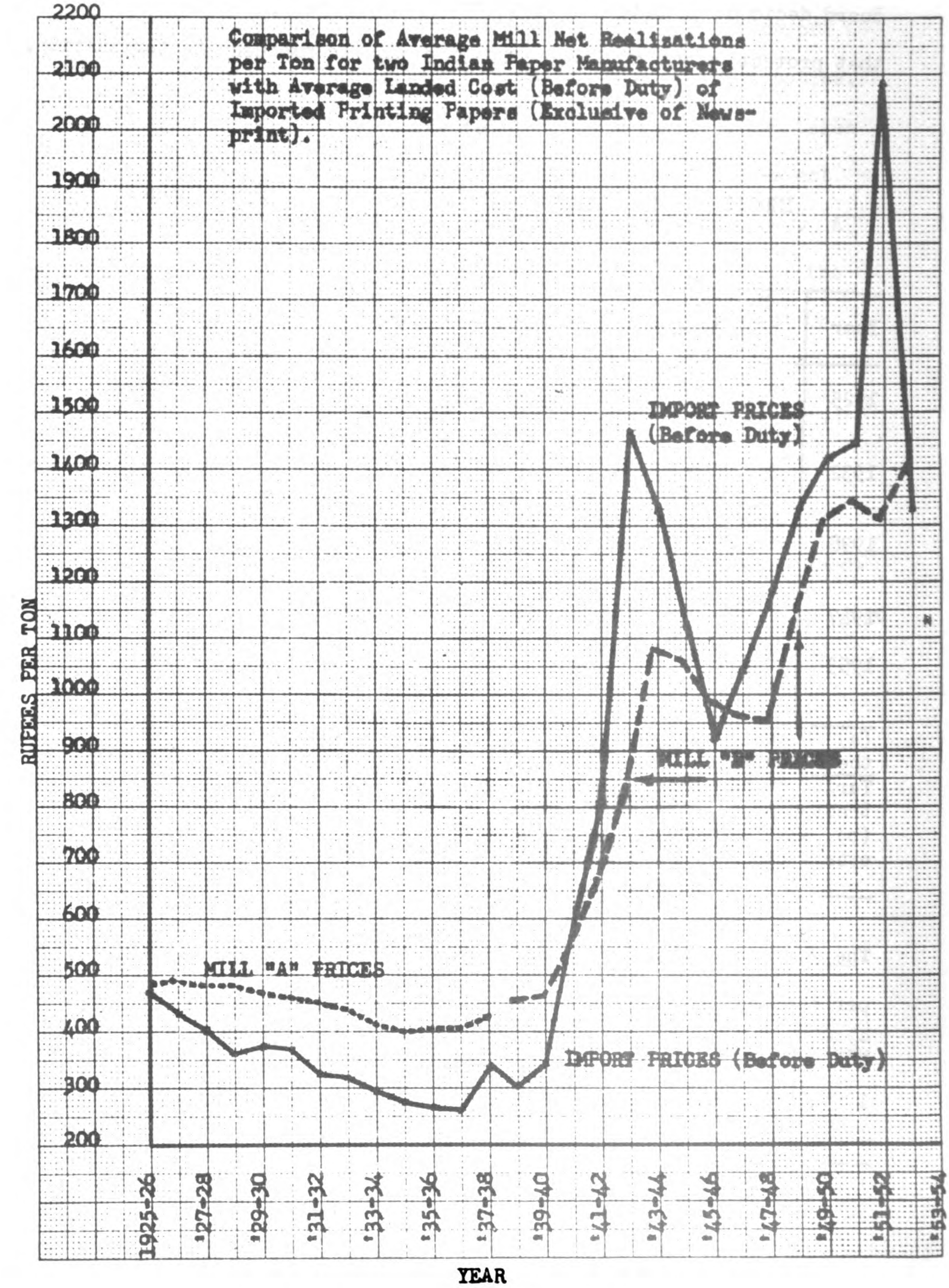
[1] *Indian Customs Tariff*, *op. cit.*, p. 30.

FIG. 4 PRICES OF IMPORTED AND OF INDIGENOUS PAPER IN INDIA, 1925-26 TO 1952-53(a)



(a) For footnote, please see following page such a high tariff wall.[1]

The relationship between the prices of imported and of domestically produced printing papers is illustrated in Fig. 4 for the period from 1925 to 1953. The two time series which are graphed are comparable only in a relative sense, since the import figures are just for printing paper while the prices realized by the mills cover other varieties as well. However, since the two mills chosen were primarily producers of better grade printing and writing papers which sell for almost the same prices, the discrepancy is not too great. For the period from 1925 through 1939 the price of indigenous papers was appreciably higher than the landed cost of foreign paper before duties and slightly lower than the price of the latter after the imposts had been paid. It is said that during this period, the paper makers set their prices just enough below the rates for imported papers to assure themselves of sufficient orders. The evidence in Fig. 4 tends to support this contention.

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[1] The substitution of "revenue" for "protective" levies is a rather well used device for granting protection without seeming to do so. Such a change-over transfers the authority for determining the incidence of imposts from the Tariff Board, which requires public hearings before altering existing rates, to the Ministry of Finance which does not. This situation can be distinctly advantageous to protectionist interests as is illustrated by the recent change in the duty on old newspapers (used for cheap wrapping paper). That duty which had never previously exceeded 31.25 per cent was raised to 66.66 per cent in 1953. Such an increase in the so-called revenue duty virtually put an end to all revenues from this source by making old newspapers too expensive to import.

Footnote to Fig. 4: (a) Prices for imported printing papers (exclusive of newsprint) were derived from the Annual Statements of the Sea-Borne Trade of India, op. cit., 1920 to 1953, by dividing the tonnage of these imports into their listed value before duty.

Mill net realizations are for two indigenous mills which produced mostly printing and writing papers. Those for Mill "A" are taken from Reports of the Indian Tariff Board, op. cit., 1931, p. 37, and 1938, p. 44. Those for Mill "B" were extracted from the records of that firm.

From 1940 through 1953, Indian prices followed the trends of import costs but stayed consistently below them. They were prevented by government restraints from achieving the wartime peaks attained by import prices but, as noted in Chapter 5, they were able to show excellent profits despite such controls and agreements. It is clear that protective tariffs on printing papers were unnecessary during these crisis years. Whether they will so remain in more normal times is a subject on which there is much difference of opinion.

The Government is committed at the present time to a policy of fostering industrial expansion and to this end it is utilizing both tariffs and restrictive import quotas. Importers are currently licensed to bring in no more than 50 per cent of their best previous year's volumes of wrapping and cultural papers (printing and writing). They are permitted only a token 5 per cent of the equivalent figure for paperboards.[1] With world prices for cultural papers remaining at high levels, quotas for printings and writings exceed what the market will absorb. By contrast, the demand for foreign made wrapping paper

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1. Import quota figures provided by Mr. J. T. Lalvani, of J. B. Advani and Company, paper importer and merchant in Bombay.

and board, the prices of which have remained comparable to those of Indian mills, still exceeds allowable quotas.

The industry and the Government are agreed on the continuing need for favoring indigenous paper at the expense of foreign varieties. The paper makers have tried to persuade the Government to ". . . permit imports just only to fill in the gap between production and consumption, and no more."[1] This would assure all of the mills of a market regardless of the quality of their products. The Government has been unwilling to go this far but has compromised by granting increases in tariff rates. It has been suggested that the paper manufacturers find it cheaper to lobby for high tariffs and for restrictive import quotas than to rationalize production and distribution operations so as to be able to compete on a relatively equal footing with foreign concerns. Without attempting to assess the validity of this last observation, the focus of this report will now turn from an exposition of selling and marketing practices to an appraisal of supervisory and managerial personnel.

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1. Indian Paper Mills Association, Presidential Address, Calcutta: June 16, 1953, p. 2.

PART II

Human Resources and Entrepreneurship

CHAPTER 7

Supervisory and Managerial Personnel

Among the most significant factors in determining the effectiveness of an industrial enterprise is the ability of the men, from the foreman level on up, who direct its operations. This is especially true in countries like India where supervision must contend, not only with the usual problems of manufacturing, but also with an array of other difficulties not generally found in more highly industrialized nations. In the less developed countries it is of critical importance that scarce capital equipment be utilized as effectively as possible and that untrained labor be given the type of leadership and instruction which it so clearly needs. These are functions which can only be performed by able and experienced managerial personnel, whether engaged in paper manufacturing or in other industrial lines. It is believed that there is probably no other aspect of development relating to the Indian paper industry in which investments of money and of talent can yield greater returns today than they can if committed to the selection and training of top grade supervision. The organization, composition, compensation, and quality of paper mill managerial personnel form the subject matter of this chapter.[1]

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[1] Information contained in this chapter is based primarily on notes taken in the course of visiting nineteen paper mills and ten managing agency headquarters.

Although the group of primary interest in this discussion is supervision at the plant level, personnel employed in central office jobs are not entirely overlooked. In some companies a fairly clear distinction is made between mill and headquarters personnel; in others the separation appears between the administrative and the production groups, with the former to be found partly in the mill office and partly at the managing agency headquarters. This separation is much more marked than is usual in an American firm since there is no real merging of the two groups at any stage in the managerial hierarchy. Production and engineering personnel tend to be regarded as technical specialists whose effectiveness is limited to the confines of the mill. Rarely are they transferred from the mill to the central office or given top positions among the managing agency elders. Such positions are reserved for those who have climbed a different ladder or who have inherited a place on one of its higher rungs. Among the British controlled paper firms, senior posts are usually awarded to those who have followed careers of a financial or administrative nature in the agency headquarters. In Indian managed organizations, top posts are more likely to go to members of the owner's family or to individuals whose careers have been devoted to serving the interests of that family.

This duality of management probably had its origins in the British social class system which developed and exported genteel administrators and competent but not highly educated technicians.

It appears to have fitted in nicely with the interests of Indian businessmen who have often chosen to have their plants supervised by foreigners while retaining for themselves complete control of finance and organization. In British operated mills the general manager is accorded considerable autonomy in routine matters although all major decisions are made at headquarters. In some Indian firms this is also true, but in others a special watch is kept on the activities of mill supervision by company secretaries who are sort of commissars from the general office. In both types of firms, however, the headquarters people have a preeminence over the production men and are set apart from them by position, by experience, and by differing sets of values and loyalties. This fact has had far-reaching implications for Indian industry since it has meant that on major policy decisions commercial and financial considerations have received much more weight than have technological or production factors. It has also meant that effective communication and exchange of ideas between mill and office has had little chance to develop.

At the plant level there is a duality of supervision of a different sort. This separation is between Indians and foreigners. The latter are found in relatively small numbers in all of the larger and better run mills, whether British or Indian managed. The total number of them is estimated to be about eighty, distributed among ten or twelve units. Most of these expatriates are from the United Kingdom but a significant minority (including nearly all of those employed by the Birla and Dalmia paper mills) are Germans. Non-Indian supervision is employed much more extensively in British controlled than in Indian owned plants. Whereas Titaghur may have more than a dozen Britishers in each of its two mills, Shree Gopal and Rohtas do quite nicely with two foreigners apiece. In the best Indian mills foreign technicians are placed only in critical, top level jobs such as chief engineer, works manager, or paper maker. Since there are no lower echelon posts in these firms in which the foreigner can get training, he must be brought in from the outside at the top level and for a specified contract period. There are several drawbacks to this situation. One such drawback is that expensive commitments must be made to a man before it is discovered whether or not he is suitable for the job. A second is that there is a failure to achieve full mill effectiveness during the first year or two of this new man's tenure, or while, as one engineer put it, he is "serving his apprenticeship to India." A third shortcoming to the use of foreign experts lies in the fact that they come to India for specified time periods only and they often return home after one or two three-year tours of duty. This engenders problems of continuity of leadership and accentuates the other difficulties noted. In the British firms there has been a long standing policy of hiring junior men from the United Kingdom and of promoting them through the mill. This is a policy which is becoming increasingly difficult to carry out in the face of heavy government pressures to replace foreigners with Indians wherever possible.

The quality of the technical and production personnel coming to India from Europe has not always been of the highest. It is said that standards have improved considerably since independence and that the old "burra sahib" type is now a relic of the past. Nonetheless it is difficult to lure the best men from jobs in the home country, and there remains a tendency to accept the second best instead. One weakness of European supervision has been an excessive reliance on men with practical experience and "know how" but with little education or capacity for leadership. Such men have in the past earned the contempt or enmity of their Indian subordinates. At the other extreme among the foreign group are a dozen or so top flight chemists, engineers, and paper makers to whom should go much of the credit for the progress which has been made in the Indian paper industry in recent years. These are the men primarily responsible in the major mills for getting out the production, solving the technical problems, and keeping the machines running despite formidable difficulties. They are men who will not easily be replaced.

The nature of indigenous supervision is not so readily defined as is that of the imported variety either in terms of origins, training, or competence. At least three factors have influenced the geographic backgrounds from which paper mill supervisors have been drawn. First among these is the natural tendency of people living in an area to seek work in that area.[1] This tendency has been reinforced in recent years by increasing unemployment with consequent pressures on the mills to give preference in hiring to residents of the states in which they are located. An influence of a different nature has resulted from the fact that prior to 1936 the state of Bengal enjoyed a near monopoly of paper making facilities and personnel. New mills requiring trained men have long recruited them from the older units, thus placing Bengalis in key positions throughout the industry.[2] A third, and much more recent factor has been the assumption by the managers of one mill of control of a second unit. This has meant that substantial cadres from the older mills have been transferred to the units newly taken over. As might be expected, supervision in the smaller and in the older mills exhibits a more provincial character than it does in the newer and larger units. As the industry continues to expand and to depend more heavily on indigenous personnel, paper technicians may be expected to become increasingly mobile and mill supervision to take on a more national character.

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[1] Men with families are often reluctant to move from one province to another because their children would have to get their schooling in an alien tongue.

[2] Recruitment of outsiders for the staffs of expanding units is generally effectuated through personal contacts with employees of older units. Qualified applicants are also obtained through advertisements placed in the country's principal newspapers.

Traditional factors of caste and community do not play dominant roles in influencing the selection and promotion of mill supervisors. The outstanding exception to this statement is seen in the continued exclusion of the untouchables or harijans from positions of responsibility in industry, although this exclusion is attributable as much to lack of education and of leadership qualifications in members of this group as to any other factor. An exception of a different sort can be seen in the propensity of certain groups like the Marwaris or the Jains to favor members of their own community within the firms they control. This tendency is more in evidence at top levels and in key administrative posts than it is among mill technicians. Where it exists, it is not clearly separable from influences of nepotism on the one hand or of provincialism on the other. Preferential treatment for members of the family of the owners of a business is a universal phenomenon and one which is duly respected in India. Like communal influences, nepotism is found mostly at higher levels of management since paper mill jobs do not have much appeal to most well-to-do Indians.

More widespread than nepotism is the familiar separation of the supervisory force into those with and those without higher education. In India this division is sharper than in Western countries for the reason that the disparities in education are wider. The _sirdars_ and _mistries_, who are the equivalent of our sub-foremen and senior craftsmen, are frequently illiterate although often highly competent in terms of practical knowledge. They form the first line of supervision although in many ways they are more closely associated with the workers than they are with higher officials. A notch above the _mistry_ level come the junior supervisors who have had enough education to be able to read English (a necessary accomplishment in a country dependent on Western technology) but who lack technical training and who have limited potential for advancement. Their immediate superiors will often be college graduates (or "B.Sc.'s" as they are generally referred to) with good theoretical backgrounds but very little practical experience. The widely publicized predilections of educated Indians for desk jobs as opposed to mill assignments and for giving orders versus "getting their hands dirty" need not be elaborated here. These biases, which are products of the Indian social system, certainly do exist and do present serious impediments to the development of a strong managerial force at the plant level. On the other hand, it should be realized that a gradual shift in attitudes is now taking place and that bright young men are appearing in significant numbers who are quite prepared to do arduous jobs in order to gain useful experience.

To train young Indians for junior managerial jobs in the mills, most paper companies have apprenticeship programs. Some of these are programs in name only which were established in bygone years in response to proddings by the Government through the Tariff Board. Others represent serious attempts to perform much needed training functions. Two categories of apprentice programs are generally found--those aimed at developing qualified mistries and those intended to train future supervisors. Recruits for the lower category of training are selected from candidates who have completed the "tenth standard" (tenth grade approximately) in school. They are given from one to five years of training in various parts of the mill and are generally taught a trade. In time many of them will replace the once powerful sirdars and mistries who, in former years, are said to have held sway as petty tyrants over the work force. Needless to say, the development of a literate group of young and experienced leaders at the sub-foreman level would facilitate industrial progress enormously. Trainees for the higher levels of supervision are mostly college graduates, an increasing proportion of whom have had schooling in engineering or chemistry. The training period, which may last from two to fifteen years, is not formalized and consists chiefly in giving the trainee experience in various departments.[1]

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1. Some companies send their apprentices to the Forest Research Institute at Dehra Dun where a modest technical training program has been set up.

Many mill managers are disappointed in the results of their apprentice schemes, especially in those for college boys. They contend that the latter show little interest in their work, are impatient with their slow progress, and usually leave the company before completing their training.

This poor showing by the apprentices is not unrelated to the level of remuneration offered to them. This varies from mill to mill but is rarely as high as Rs. 150 per month and may be as low as Rs. 42. Several firms select their apprentices from well-to-do families only, with the expectation that the families will subsidize their sons during the training period. The explanation for this low salary seems to lie partly in the traditional outlook of managements[1] and partly in the low market prices of college graduates. A departure from this cheap supervision policy has recently been initiated in the two mills managed by Balmer Lawrie and Company. Realizing that it will have to replace most of its British supervisors by Indians in the near future this managing agency has begun recruiting the highest quality candidates it can find and offering them three to five times the going rates for college graduates. This progressive approach should pay off handsomely in the next five to ten years.

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[1] When queried about the near subsistence wage paid to apprentices in his mill, one manager replied: "Apprentices are like nurses--if you pay too much you get the wrong type."

Supervisory training of a different sort has been going on for the past seven or eight years under the sponsorship of the Indian Government and with the assistance of the United States and the British Commonwealth. As noted in the previous chapter, selected technicians and production men have been given opportunities to visit mills and to study paper technology in Europe and America. Returning to India these men have received responsible posts in the industry and have been active in promoting progress and change within their companies.

The supervisory organization of the mills is characterized by a concentration of power at the top and by a reluctance to delegate responsibility to junior members of the managerial group. The role of foreign experts is, of course, inconsistent with this general policy since they are invested with broad, discretionary authority within their technical bailiwicks. The weakness or absence of so-called middle management in Indian controlled mills is both the cause and the result of this localization of authority at the top level. In British directed units there is somewhat greater diversification of responsibility due to the larger number of British supervisors, yet junior staff members have been known to complain of being treated "like boys in a prep school."

The tendency of plant managers to be endowed with a sort of paternal authority is a reflection of the fact that the supervisory hierarchy is still organized along small plant lines. Mills have grown in size and complexity but managerial outlooks have lingered behind. Policies and decisions of higher authorities still tend to have elements of secrecy and arbitrariness about them which are inconsistent with the maintenance of effective communication or good morale. Lack of systematic job and salary rating, for example, leads to some rather extraordinary disparities in levels of pay and encourages the divisive influence of favoritism. Salary levels for junior supervisors are not a great deal higher than they are for apprentices and have commensurate lack of incentive power.[1] The range of remuneration between the top and bottom levels of supervision is relatively wide for Indian personnel and wider still if salaries paid to foreigners are included. Starting wages for college graduates without special training vary from Rs. 75 to Rs. 150 per month. The salary range for junior staff members, who comprise most of the supervisory force, is from Rs. 75 to Rs. 500. Stipends going to senior Indian supervisors are usually between Rs. 500 to Rs. 1,000 with a handful receiving more than that top figure. Salaries of foreigners mostly fall between Rs. 1,200 and Rs. 3,000, the latter figure being for the manager of a

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[1] Scales of pay are appreciably higher in mills located in the Calcutta and Bombay industrial regions than they are in other parts of the country. They are usually higher also in the larger than in the smaller firms.

British mill.[1] These figures point up both the much higher costs of foreign versus Indian supervision and the inherently unhealthy (although inevitable) fact that European technicians are frequently paid much more than their Indian bosses.

The basic salary paid to a paper mill supervisor does not constitute his sole return from the company for services rendered. Usually he enjoys several other benefits--some in cash and some in kind. Recompense of the latter sort may include free hospitalization and medical treatment for the supervisor and his family, company sponsored schooling for his children, the privilege of living in a company house at little or no rent, and the use of the facilities of a company recreation club. Extra compensation in monetary terms may take such forms as production bonuses, profit sharing dividends, dearness (cost of living) allowances, and contributions to the Provident Fund. Except for housing, the non-financial benefits listed above are enjoyed on relatively equal terms by all mill officers. Other emoluments are generally so distributed as to increase the disparity between the living standards of the upper and the lower supervisory echelons.

Such disparities are most apparent in the British managed firms but are not absent from the others. Among the extra benefits granted to senior British staff members at one fairly typical mill are an overseas allowance of 50 per cent of basic salary; six months home leave every three years (including the cost of round-trip passages to the United Kingdom for an entire family); a large and comfortably furnished bungalow; two to four servants; and the use of a company car, with driver. The cost of these benefits normally amounts to more than the individual's basic salary, which makes foreign supervision a relatively expensive service.[1] If it is acknowledged that such emoluments are necessary to attract and to hold good European paper makers, and if it is agreed that a really good man will justify every bit of this investment, the fact remains that there is a very good economic (not to mention political) argument for seeking to replace foreign supervisors with Indian nationals.

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[1] One reason that so few American paper experts are to be found in India is that it costs Rs. 4,000 a month or more to keep them there.

The issue of Indianization of supervisory employees is an especially controversial one since opinions on this subject seem inevitably to get tangled up with national pride and individual prejudice. No one denies that within the next decade the industrial sector will experience the widespread replacement of foreigners by Indians, and few question the belief that intensive

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1. In the same mill a senior Indian staff member would be paid approximately 40 per cent as much in salary and incentive bonuses as his European equivalent, and he would probably be given a modest house and servants allowance. His cost to the company would be about 25 per cent of that of a European.

training of qualified Indians will be necessary if this transition is to be successful. Elements of doubt and contention concern the questions of how fast and how far such a changeover can take place without appreciable losses in productive efficiency. Differences of opinion on these matters stem from differing evaluations of the ability, present and potential, of Indian supervisors. Appraisals by the most fair minded of the Indian and foreign managers with whom the writer came in contact indicate that there are top grade Indian supervisors in every well run paper mill but that they are relatively few in number. Their development in larger numbers was held back in pre-independence days by lack of opportunities, but, at the same time, little initiative was shown by the Indians in attempting to surmount this handicap. It seems generally agreed that candidates for supervisory positions possess intelligence, alertness, and theoretical knowledge in abundance but are less generously endowed with self-confidence, practical knowledge, and drive. Foreign managers appear to feel that they can train Indians to replace all but two or three key men in their organizations but doubt that indigenous personnel will be equipped for many years to come to take over these critical spots. Indian managers who have already accomplished this first transition are not prepared to relinquish their Western experts in the near future either. When asked why they wished to retain foreign technologists, these managers gave varied answers. One said that the Europeans showed more responsibility towards the job than did indigenous supervision; another said that they maintained higher standards and had more success in dealing with subordinates. A third top official suggested that they didn't need foreigners to operate existing equipment but that they did need them to help in expanding mill facilities and in adapting new methods and ideas to local conditions. Possibly the most significant differentiating characteristic between Indian and Western supervisors at the present time can be seen in their respective attitudes towards their jobs. The latter, having been raised and trained in industrially minded societies, possess a regard for their work and a devotion to their calling which transcends mere economic motivation. Few Indians in the paper industry appear as yet to have acquired this outlook, which, whatever else may be said of it, is a powerful asset to industrial development.

The foregoing discussion has attempted to point out significant characteristics of various groups which are found in the ranks of paper mill supervision. It should perhaps be emphasized that there are very wide differences in the quality and effectiveness of supervisory personnel as between mills. Several of the more progressive companies appear to be developing increasingly alert and competent assemblages of technologists and production men while other units continue to plod along in their accustomed ways. Supervision in state operated mills does not differ in most respects from that in private firms but it does seem to be characterized by somewhat lower levels of incentive and initiative than are seen in the latter. As noted in the last chapter, state mills suffer from excessive auditing and from the unwillingness of political officials to delegate financial responsibility to plant managers. In two of the three state mills the managing director cannot make commitments on items costing more than Rs. 500 without the approval of higher authorities. In the third of these mills the finance ceiling on the managing director is Rs. 3,000. Probably the most serious shortcoming of state mill supervision derives from the lack of qualifications of the managing directors. These men are competent civil servants trained in completely alien fields who have been placed for temporary periods in positions for which they have neither a natural aptitude nor adequate experience.[1]

These facts have not gone unrecognized by those officials of the Central Government who are concerned with the welfare of the paper industry. Under consideration at the present time are plans for operating selected government plants through independent public corporations. If these plans should be implemented, the Government might find that it had acquired a useful yardstick, in the form of its quasi-privately managed mills, against which to measure the performance of the rest of the paper industry. Viewed from a different perspective, paper mill operation by a public corporation should furnish an illuminating illustration of how well government management can function in an industry of this type.

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[1] Of the three state mill directors, one had previously been a school superintendent, another a forester, and the third a civil administrator.

As noted earlier in this chapter, major changes have been gradually taking place in the organization, composition, training and attitudes of paper mill supervisory personnel. Some of these changes have been necessitated by the expansion of the industry and by the introduction of new technology, while others have been encouraged by policies of the Government, supplemented by a certain amount of foreign assistance. Although fairly extensive progress in raising the standards of supervision has been made in a number of mills, the need for further advancement in this respect is still very great.

In the following chapter another important and still underdeveloped resource of the paper industry--its labor force--will be discussed.

CHAPTER 8

Paper Mill Labor and Labor Relations

The labor force found in the pulp and paper industry today is probably fairly representative of industrial labor in India as a whole. It is notable for its agricultural origins and attitudes, for its relatively low levels of literacy and education, for its surplus members, and for its largely unrealized productive potential. In recent years a number of changes have been taking place in the work force itself and in the environment in which it operates. Among the most significant of these have been a widespread expansion of trade union activity, a successful extension of company paternalism, and an increased concern on the part of the Government with worker welfare and labor management relations. The implications of these changes are considered below, following a discussion of the nature and composition of paper mill labor.

The number of wage earners directly employed in paper mills in 1953 amounted to about 22,000 persons. This group of regular employees was supplemented by contract workers numbering from three to five thousand, some of whom were engaged in work directly related to production and others (probably the majority) of whom were utilized mainly on construction projects. Because of the dual functions of contract laborers and because of the intermittent employment of a considerable amount of temporary labor, it is not possible to state with greater precision the number of workers engaged in any one year in paper mill operations.[1]

In addition to those employed at the mills, the industry annually provides many thousands of jobs to people of rural areas in extracting bamboo and grass from the forests, as noted in Chapter 3. For a majority of these people, this is only part-time work lasting for six months or less of each year. For this reason it is difficult to estimate how many people are so employed. A calculation made by the Titaghur Paper Mills in 1950 placed at forty thousand the number of workers engaged in bamboo and grass extraction for a production of 38,000 tons of paper.[2] This figure suggests that one hundred thousand people or more may share in the Rs. 12 million[3] which the industry is estimated to pay annually for work in the forests.

However, it is not with these jungle workers nor yet with contract labor that this chapter is concerned. The group to be considered here are the twenty-two thousand who are on the permanent rolls of the mills.

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1. Data compiled in this chapter, as in the previous ones, are based primarily on interviews with mill, government, and, in this instance, trade union officials. This material has been supplemented by data from a July, 1952 survey of labor conditions in the paper industry made by the Labor Bureau of the Central Government. The unpublished survey results were made available to the writer through the kindness of the Director of the Labor Bureau. Similar survey summaries for January, 1948 and July, 1949, have been published in the January, 1949 and June, 1950 issues of the Indian Labour Gazette, respectively. For further background information see: Government of India, Report on an Enquiry into Conditions of Labor in the Paper Mill Industry in India, prepared by S.R. Deshpande, New Delhi: Manager of Publications, 1946.

2. Mitchell, F.S., and Shuttleworth, L., The Titaghur Paper Handbook, Calcutta: Published by F.W. Heilgers and Company, Limited, 1950, p.1.

3. See Chapter 3 for the derivation of estimates on the labor costs of extracting, (a) bamboo, and (b) grass from the jungles.

This group is composed of approximately 95 per cent men and 5 per cent women.[1] With the exception of a few adolescent boys, the industry employs no child labor. All mills depend quite heavily on surrounding communities to supply their labor needs, but several of them employ as much as 50 per cent of their worker force from other provinces. This is particularly true of units in West Bengal and in the Punjab. Bengalis and Punjabis appear to be less fond of heavy manual labor than do their neighbors from Bihar and the United Provinces. As a result, people from the former states tend to fill jobs in local mills which call for clerical, mechanical, or supervisory aptitudes, and to leave to the inhabitants of Bihar and the U.P. especially (but also of Madras and Orissa) the less skilled and less desirable occupations.

As was noted in the case of supervisors, workers with particular skills are to be found in mills outside of their home provinces. The accepted methods for attracting such skilled workers are through family connections, friends, employment exchanges, and advertisements. These methods are also used for obtaining unskilled labor, but most firms find that they can hire at the gate all of the untrained manpower they can use. Hiring functions are still carried out by mill managers or department heads in almost half of the paper firms, but there is a growing tendency to systematize this work by placing it under the personnel officer, utilizing medical examinations, and giving preference to workers previously retrenched (permanently laid-off).

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[1] These are Labor Bureau figures made available to the writer at Simla, April 1954.

The paper mill work force is predominantly Hindu in its make-up but contains significant minorities of other religious groups. The Sirpur mill in Hyderabad employs about 50 per cent Muslims, and the Shree Gopal unit in the Punjab contains a high proportion of Sikhs. Elsewhere in the industry these two groups are to be found in smaller numbers and working almost exclusively as mechanics or skilled craftsmen. The partition in 1947 and the communal riots in 1950 caused several hundred paper mill workers of Mohammedan faith, many of them highly skilled, to flee to Pakistan. The majority of them did not return.

As a general rule, communal, religious, and caste distinctions have little significance within paper mills. Realizing that these divisive forces are incompatible with effective industrial operations, mill managers have attempted to minimize their influence. As noted earlier, one significant exception to this policy is made for members of the sweeper caste for whom are still reserved jobs which are deemed degrading or distasteful. Consistent with this exception is the unwillingness of some skilled and clerical employees to do menial tasks which may be associated with their jobs.

Indian labor is notable for the strong ties which bind individual workers to their native villages and to their traditional agricultural pursuits. Workers in pulp and paper making do not depart from this pattern, although the pull of agriculture is greater in some regions than in others. Those who live in villages close to a mill can pursue agricultural and industrial occupations simultaneously, but others who come from distant areas have a habit of taking annual leaves of a month or more to visit their families and to help with the planting. The majority of those whose homes are far from the mills bring their wives and children to live with them, but an appreciable minority leave their immediate families behind and live as bachelors for eleven months of the year. The combined pulls of farm and family lead to overstayed leaves, malingering, and high rates of absenteeism. The annual average per cent absenteeism for the industry was recorded as being 11.0 in 1952, with a range from 4.1 per cent for the lowest mill (Sirpur) to 30.3 per cent for the highest (Rohtas).[1] Of comparable importance to home ties as a cause of absenteeism is sickness. Although there are many diseases which debilitate the labor force, the chief offender has long been malaria. Fortunately, its incidence has been sharply reduced in recent years through the employment of drugs and of malaria control techniques by plant managements and medical officers. Communities have generally benefited from the anti-malaria activities of the mills since it is not possible to combat the disease effectively within a mill compound without also treating the surrounding area.

The rate of labor turnover is well below that for absenteeism. This fact suggests that even though workers have strong ties to their native villages most of them make satisfactory adjustments to industrial life. The turnover figure for 1951-1952 was 6.7 per cent, more than one-half of which was attributable to discharges.[2] The problems of industrial discipline implied by this last figure are not inconsiderable. Some of them stem from the worker's village background and from his failure to appreciate the importance, for example, of staying awake on the job or of not spitting (betel nut juice) inside the mill. Others are outgrowths of poverty, ignorance, and propensity to seek redress for grievances through violence.[1] Disciplinary action which was formerly somewhat arbitrary in nature has now been codified under the Industrial Employment (Standing Orders) Act, 1946.[2] In the mills, written charge sheets replace the kicks and cuffs formerly bestowed on erring workers, and opportunities for hearings before top mill authorities now precede all dismissals.

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[1] These are Labor Bureau figures compiled from questionnaires sent out to all the mills. Presumably they include absence from all causes, but definitions of absenteeism may well have varied as between the mills.

[2] Labor Bureau figures.

More than 50 per cent of paper mill workers are estimated still to be illiterate and an even larger proportion of them are able to speak only in their regional language. Up to the present time these limitations have been less serious obstacles to productive activity than might be supposed, since the majority of jobs have not required the ability to read and the majority of laborers have learned to understand simple instructions in Hindi or whatever has happened to be the plant language. Both literacy and bi-lingualism will increase extensively in the next decade in response to the country's broad program of education. Needless to say this will prove a boon to the paper industry since modern production methods presuppose workers who can read instructions and who can transmit information and knowledge.

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[1] In one mill, the brass bearings are removed from certain machines whenever they are not in use to forestall the theft and subsequent sale of the metal in the local bazaar.

[2] Government of India, Ministry of Law, The Industrial Employment

Efforts on the part of paper mill managements to develop skilled tradesmen and capable operators have already been referred to in the previous chapter in connection with supervisory training. Apprenticeship programs frequently encompass the training of both skilled workers and junior supervisors, with the latter being selected from among the more outstanding members of the trained worker group. As noted in Chapter 7, these programs have a mean duration of five years and pay what might be characterized as mean wages.

The subject of wages in large-scale Indian industries, including the pulp and paper industry, requires some special explanations due to its complex character. The remuneration received by a worker usually includes not only his basic wage but also a variety of allowances, bonuses, and special compensations. Most common among these additions to the base pay is the so-called dearness allowance or "d.a." This is a sum which is tacked on to a worker's wage to compensate him for increases in the cost of living as a result of wartime and postwar inflation. In one mill it amounts to less than one-sixth of the minimum basic wage and in another it is four times as great as the latter. This is indicative of the wide range to be found in both of these components of worker pay. In view of the stabilization of living costs in India since 1951, the d.a. could well be consolidated with the basic wage, but few employers have been willing to effect such a consolidation. Their reluctance may be attributed either to their expectation of a deflationary period ahead

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(Standing Orders) Act, 1946, Delhi: Manager of Publications, 1946.

or to their desire to minimize bonus payments, which are calculated on basic wages. Other allowances paid to workers are for such items as fuel and rent, while special compensation may be given in lieu of the free food which had been formerly distributed.

The sum of basic wages and allowances constitutes the worker's monthly pay but does not generally comprise his entire remuneration. In addition, the majority of wage earners can expect one or more bonus payments. The most usual custom in Indian industries is to give annual lump sum holiday bonuses amounting to several months basic wages--the number of months depending on the profits of the previous year and the strength of the unions involved.[1] This pattern is followed by seven firms, including those in West Bengal where the pressure for a Puja[2] bonus is very strong. Some paper firms have no profits to distribute while others prefer to tie their bonus payments more directly to worker productivity. Schemes to accomplish the latter objective are found in nine mills and have had marked success in concerns such as Shree Gopal where employees get a generous dividend for all production in excess of a monthly target.

The production bonus is the most common form of incentive in the paper industry, since 95 per cent of the workers are paid on a time basis and only 5 per cent are on piece work. Most of this 5 per cent

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1. Payment of the bonus may be conditional on the worker's having a good attendance record or not participating in strikes or slowdowns.

2. The Pujas are traditional autumn holidays in West Bengal and certain other parts of India during which heavy expenditures are usually incurred for religious celebrations.

consists of finishers whose job it is to inspect, count, and package the finished sheets of paper. In addition to finishing operations there are in every mill a host of other jobs that would lend themselves to incentive schemes based on individual or group output. Although there is little reason to doubt that such schemes could yield large labor savings, it is unlikely that they will be adopted in the foreseeable future. The chief obstacles to the acceptance of incentive schemes are the lack of trained personnel to set up and implement them, combined with the reluctance of mill managements to stir up labor troubles by displacing workers for whom alternative jobs are not available.

A comparison between mills of total wage payments, including allowances but not bonuses, shows wide variations in rates paid for comparable job levels. Taking the minimum or starting wage of each firm as the unit of measurement, the highest rate in 1953 was Rs. 85 per month, paid by Tribeni Tissues Limited, and the lowest was Rs. 31 per month, paid by the Mysore Paper Mills. The median figure was Rs. 60 per month, paid by Rohtas Industries. Wage levels in particular units reflect the influences of the familiar factors of the cost of living, the regional wage pattern, the employer's ability to pay, and the aggressiveness of the union. Wages in the Calcutta area are uniformly high while those in South India and those of the smaller and poorer firms are consistently low. Firms which have been extremely prosperous, like Orient and Shree Gopal, pay relatively high rates even though they are located in low wage areas.

In response to union pressures, there is a growing tendency to systematize both the wage structure and the method of granting increases.[1] A few firms still cling to their traditional policies of rewarding employees on a discretionary basis but the number of such firms is declining. At least twelve units now give regular periodic increases, and eight of these have established formalized grade classifications for all employees. These classification schemes differ considerably from one another and are not readily comparable due to varying job specifications. They are indicative, however, of an increasing appreciation by paper mill managements of job evaluation and of the desirability of letting workers know where they stand.

Worker compensation, like that of supervisors, is not limited to wage and bonus payments. Additional benefits include certain forms of social security payments, housing, and what in India are known as amenities. These last comprise medical care, rest shelters, subsidized grain shops and canteens, company sponsored schools, and recreational facilities. Under the Employees Provident Funds Act, 1952,[2] paper workers are eligible for compensatory payments for old age, permanent and total disability, and unemployment exceeding three months. These benefits are financed by the mutual contributions of the employer and the employees,

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1. Other conditions of employee compensation such as the length of the wage period, the time of payment, and the permissable extent of deductions and fines have been standardized since 1936 by legislative action. Government of India, Ministry of Law, The Payment of Wages Act, 1936, (4 of 1936) (as modified up to May, 1951), Delhi: Manager of Publications, 1952.

2. Government of India, Ministry of Law, The Employees Provident Funds Act, 1952, (19 of 1952) Delhi: Manager of Publications, 1953.

with the former bearing slightly the heavier load. The employer's contributions are generally 6.25 per cent (but may be increased to 8.33 per cent) of the employee's basic wage and dearness allowance. More comprehensive sickness and disability benefits have been authorized under the Employees State Insurance Act, 1948,[1] but nationwide opposition by employers has delayed the implementation of this legislation.

Of comparable significance to the social security program in terms both of worker welfare and of additions to the employers' costs, are the housing schemes of many of the paper companies. Some form of worker housing is provided by sixteen of the twenty mills--the proportion of wage earners housed by these firms varying from 8 to 85 per cent. The most elaborate housing programs are to be found among new and expanding units, most of which are located in rural areas where living accommodations are primitive and inadequate. Firms providing little or no housing are all located in or near large population centers.

To combat the spread of bustees, or worker slums, the Government has developed a comprehensive industrial housing scheme.[2] Under this scheme, employers are given loans up to 37.5 per cent and subsidies up to 25 per cent of the cost of the accommodations to induce them to provide adequate dwellings for their work forces. In return for this aid, the Government assumes the right to require detailed minimum specifications, to set maximum rentals, and to outline conditions of ownership and management. Almost half of the paper mills have chosen to take advantage of this proffered government assistance. Three or four others have elected to build their housing independently, while the rest have been in no financial position to undertake any housing construction whatsoever. Standard costs for dwellings meeting minimum government specifications range from Rs. 2700 to Rs. 5600 per unit, depending on size and location. These standard costs are exceeded by the expenditures of companies which choose to provide more than minimum dwellings. Although the Government recommends charging moderate rents, the majority of mills provide their houses free of charge. The assumption of rental charges is calculated by one firm to be the equivalent of 10 per cent of the consolidated wage bill.

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[1] Government of India, Ministry of Law, The Employees State Insurance Act, 1948, (34 of 1948), (as modified up to the 15th of January, 1952), Delhi: Manager of Publications, 1952.

[2] Government of India, Ministry of Works, Housing and Supply, Subsidized Housing Scheme for Industrial Workers, Delhi: Manager of Publications, 1953.

In the field of employee welfare and working conditions the Government has also taken an active role. Under the previously cited Industrial Employment (Standing Orders) Act, 1946 and the Factories Act, 1948,[1] state governments are empowered to define minimum conditions of employment and to specify standards to be followed by employers in respect to the health, safety, welfare, working hours, and leave privileges of workers. All but the most impoverished of the paper firms abide by these official standards and most of them provide more extensive welfare benefits than are actually required.

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[1] Government of India, Ministry of Law, The Factories Act, 1948, (63 of 1948), (as modified up to the 1st of April, 1951), Delhi: Manager of Publications, 1951.

The most impressive example of company sponsored welfare and amenities seen by the writer was that of the Orient Paper Mills. Adjacent to its 30,000 ton mill, which is situated in a jungle area of Orissa, this organization has constructed an attractive and well appointed company town which accommodates all supervisors and about 50 per cent of the work force. To serve this town the company maintains a well staffed hospital and a large recreation club, it subsidizes a movie theatre, a dairy, and a school, and it provides free water and electricity to all employees. Eight other companies offer within their mill compounds comparable, if slightly less extensive, facilities for their workers. The rest of the paper concerns provide amenities in lesser degrees. The most comprehensive worker facilities and benefits are to be found among the more prosperous of the newer mills (i.e., those established since 1936). It is worthy of note that these same mills appear to have achieved the best employer-employee relations in the industry. However, it is not certain to what extent these good relations can be attributed to paternalistic welfare measures alone.

Two of the most noticeable aspects of labor conditions in India, to American eyes at least, are the degree of dependence of the worker on his employer and the extent to which the Government has become a party to almost all important decisions concerning the working man. These two factors are not unrelated, since one of the reasons for government intervention has been to protect the laborer from exploitation by owners and managers. The almost feudal dependence of the worker on his employer appears in some respects to be increasing and in others to be on the wane. The growth of trade unions and the solicitous interposition of the Government have ameliorated the worker's lot and strengthened his bargaining power. On the other hand, the extension of company housing, and of medical, recreational, and educational schemes has tended to tie him closer to his employer and to bring more aspects of his life and that of his family under company purview. In most respects the laboring man has benefited from managerial paternalism which has done for him what he had neither the capital nor the training to do for himself. It has, however, discouraged him from developing initiative and a sense of responsibility for his own affairs. One suspects that the burgeoning of these latter qualities must wait until the influences of increased education and higher standards of living have made themselves more fully felt.

In those mill communities where the needs and aspirations of workers are met with reasonable adequacy, the ties which bind those workers to their native villages are appreciably weakened. As industrial working and living conditions improve, and as social security provisions diminish the dependence of workers on their relatives in times of need, it seems reasonable to expect that an industrially minded labor force will develop which will not have its roots in the land. The growth of such a group would be highly desirable from the point of view of industrial development. One of the primary obstacles to the large-scale conversion of farm laborers to factory workers is its high cost. In the case of the paper industry, it is only the more prosperous mills which have been able to make adequate provisions for the needs of their employees. This is true despite the protected market which the papermakers have enjoyed for the past fifteen years. A number of thoughtful Indian leaders, including members of the Planning Commission, have recently expressed their apprehension that the benefits and safeguards granted to labor are becoming so onerous as to discourage new enterprise and to endanger the competitive position of existing firms, especially those which manufacture for export.[1]

The normal employer responses to increases in labor costs are to tighten up on plant efficiency and to introduce more labor-saving machinery. Both of these responses presuppose the employer's ability to retrench excess workers--a procedure which has become so difficult and so expensive in India that most firms are reluctant to attempt it. To reduce the number of its nonsalaried employees a company must: (a) face the possibility of a strike; (b) go through lengthy adjudication proceedings in the hope of getting what amounts to permission from a Labor Tribunal,[2] and, if successful; (c) pay repressive rates of compensation to those released from their jobs.[3] The easier course is to continue to carry excess personnel--an option which was chosen by eighteen of the nineteen mills visited. The one firm which did not carry too many workers was actually operating short handed, but its manager was unwilling to hire additional help which he might have to keep when no longer needed. The implications of this anti-retrenchment policy were spelled out by a former Finance Minister of the Central Government who noted that:

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[1] The Times of India, December 9, 1953, p.1.

[2] Labor Tribunals are quasi-judicial bodies established by the Government for the compulsory arbitration of industrial disputes.

[3] Under the present law, employees temporarily laid off are entitled to compensation for the period of lay-off equal to 50 per cent of basic wages and dearness allowance. Workers who lose their jobs through retrenchment receive fifteen days average wages for every year of completed service. Government of India, Ministry of Law, The Industrial Disputes (Amendment) Ordinance, 1953, Delhi: Manager of Publications, 1953.

> /There is/ a great danger that people who happen to be in jobs at a particular time become a privileged class and that a very large part of the resources of industry is mortgaged to preserving and extending the amenities of that particular section of the community, regardless of the effect on the power of industry to adapt itself to changing conditions and to provide further opportunities for employment.[1]

The explanation for the insistence by unions and by local government officials on the employment by firms of unneeded personnel lies, of course, in the acute and ubiquitous problem of unemployment and in short-run attitudes toward the resolution of that problem. Popular sentiments respond much more readily to the outcries of distressed workers than to the protests of managers or to the arguments of economists.

The ability to capitalize on worker discontent is a talent which has been widely exploited by Indian politicians, many of whom began their careers as leaders of local labor groups. From its inception the Indian labor movement has been highly political in character with leaders drawn not from the working class but from the country's reservoir of unemployed intellectuals. Labor welfare has often played secondary roles to nationalist agitation and to political rivalry, but the workers have not been entirely neglected. Unable to organize themselves, they have achieved notable gains under outside leadership, although the price has sometimes been high.

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[1] Raisman, Sir J., as quoted in Capital, Feb. 25, 1954, p.246.

Most Indian unions are affiliated with one of four national labor organizations, three of which are closely allied with political parties. The number of paper mill unions said to be affiliated with each of these national organizations is indicated below:

Organization	Party Affiliation	Paper Mill Unions
All India Trades Union Congress	Communist	2
Hind Mazdoor Sabha	Praja Socialist	5
Indian National Trades Union Congress	Congress	10
United Trades Union Congress	none	—
Independent	none	4
Unknown	—	2
Total		23

The strength of the I.N.T.U.C. (Congress Party) is not so great as these figures suggest since many of its associated unions are in the smaller mills. Conversely, the influence of the Communist Party organization is understated since its members hold key positions in at least three unions not affiliated with the A.I.T.U.C. Of the four unions listed as "independent" probably only one deserves that title. The others show distinct symptoms of company domination. Neither the membership totals of the local mill unions nor the relative strengths in the paper industry of the rival national organizations are accurately known. Most unions claim far more members than they actually receive dues from, since the majority of workers show only an intermittent interest in union affairs. Despite their common ties to the central union congresses, local paper workers unions have little to do with one another. Such concerted actions as they do undertake generally consist of strikes or demonstrations of sympathy and support for unions in neighboring mills engaged in other lines of work.

Paper mill unions are usually organized and directed by a leader who does not belong to the work force. Some of these leaders are active politicians and members of state legislatures, while others appear to follow full-time careers as entrepreneurs of organized protest. The Left Wing leaders are generally more effective trade unionists than are those affiliated with the Congress Party. They receive support from the rank and file because they are forceful speakers and organizers, and because they get results from management. The workers are relatively indifferent to political and social ideologies and this indifference permits the leaders to impose their personal political preferences on their respective unions. With its agrarian origins, Indian labor is by nature conservative and less susceptible to revolutionary ideologies than is the better educated and more discontented white collar class. It is from the latter group that the unions draw some of their most effective leaders.

Union-management relationships are patterned and circumscribed to a large extent by two pieces of legislation, the Indian Trade Unions Act, 1926, and the Industrial Disputes Act, 1947.[1] The first of these laws defines the rights and obligations of registered trade unions; the second law, which governs industrial disputes, sets up the machinery for the resolution of labor-management conflicts. This machinery includes provisions for public inquiry, conciliation, and compulsory arbitration. It is the last of these provisions which is of the greatest significance since it transfers to public Labor Tribunals the responsibility for deciding questions which under collective bargaining would be resolved by the parties themselves. During the first two or three years of their existence the Labor Tribunals were widely criticized for making awards which were gravely inconcistent with one another and which ignored economic and industrial realities. Since 1950 the situation has changed, so that now whatever consistency there is between the structure and levels of wages and benefits paid by various mills is largely attributable to patterns set by these tribunals. Government leaders say that they would like to substitute collective bargaining for the decisions of tribunals but they feel that labor is not yet strong enough for this changeover to be made.[1]

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[1] Government of India, Ministry of Law, The Indian Trade Unions Act, 1926, (16 of 1926), (as modified up to the 1st July, 1952), Delhi: Manager of Publications, 1952; and, The Industrial Disputes Act, 1947 (14 of 1947), (as modified up to the 24th October, 1953), Delhi: Manager of Publications, 1953.

The growth of union strength in paper mills dates from 1946. Before that time many of the firms had no trade unions and labor activity was mostly limited to sporadic outbursts in response to particular situations. Since 1946, one or more unions have been organized in all of the mills. Most of these labor bodies are registered under the law, and more than half of them are recognized by the employers. Recognition does not imply either exclusive bargaining rights for the union over all mill employees or the existence of any contractual relationship between the employer and the labor organization. It does mean that the employer is willing to meet with union officials to discuss issues and grievances. Paper mill managements, with three or four significant exceptions, have learned to accept unionization of their plants, to recognize the authority of the union leaders, and even, in some cases, to acknowledge the constructive functions which labor organizations perform. The strongest resistance to the extension of union activity and authority has come from the managements of the larger and more powerful firms, one of whom, Titaghur, has just endured a six and one-half month strike rather than accede to union demands. These firms may succeed for a time in retarding the growth of union influence in their mills, but it seems likely that their efforts will be no more than holding actions.

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[1] This was confirmed in a speech by the then Labor Minister, Mr. V.V. Giri, to the Indian Labor Conference on January 7, 1954. Hindusthan Standard (Calcutta), January 8, 1954, p.7.

In addition to the unions, there are two other agencies to be found in most mills which engage in the solution of industrial relations problems. These are the local works committee and the company labor (or labor welfare) officer. The works committee is an employer-employee group which is supposed to preserve "amity and good relations between the employers and workmen. . ., and /to/ endeavor to compose any material difference of opinion."[1] The functions of these committees tend in a number of ways to overlap those of plant labor unions, with a resulting ambivalence in union--committee relationships. In some mills the unions shun any sort of association with works committee activities. At the opposite extreme, unions in other firms get their members elected to all of the employee posts on their respective plant committees and thereby transform the latter assemblies into union-management negotiating groups.

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[1] The Industrial Disputes Act, op. cit., p.5.

The company labor officer is a specially trained man who must by law be employed by all firms above a certain size (usually 500 employees) to protect the rights and to promote the interests of the labor force. As is the case with the works committee, his functions overlap those of other individuals or organizations in the mill, to wit, those of the personnel director, of the union leader or mill representative, and of the plant grievance committee, if there is one. In some mills the labor officer is synonymous with the personnel officer, but in others he is regarded as an unnecessary and unwanted outsider who is excluded from effective membership in the management organization. There is a real ambiguity in the position of this professional champion of labor since, although his responsibility is to the work force, his authority stems from the Government, while his outlook for promotion and a personal career depends entirely on management. This situation impairs his effectiveness to a noticeable degree. The labor officer and the works committee have been fostered by the Government in attempts to do for Indian labor what it is not yet prepared to do for itself. Although both fulfill certain useful purposes at the present time, the long run necessity for or viability of either seems somewhat doubtful.

In attempting to discern how the growth of the paper industry has been and will be affected by the conditions and changes in its labor force, one is led to mixed but fairly optimistic conclusions. The Indian paper worker is something less than an ideal industrial employee from the standpoint of physique, health, education, adjustment to the mill environment, and attitude towards the job. His background has not prepared him for the conditions to which he must accustom himself nor equipped him with the abilities and skills which he needs. This background can be changed, however, and is being changed, both for present day workers and, even more so, for their successors to come. Some of these environmental improvements will take place on a nationwide scale while others will result only from efforts made by individual firms.

There are no known figures by which the productivity of Indian paper workers may be compared with that of their Western counterparts, given the same equipment. As was noted in Chapter 2, the effectiveness of paper mill labor varies widely from plant to plant, depending both on the type of equipment used and on the living and working conditions of the laborers. Studies made in other industries indicate that Indian workers produce between one-third and two-thirds as much as European or American workers with comparable materials and equipment.[1] It is not unreasonable to assume that this same productivity ratio holds true, at least approximately, for the paper industry. On the other hand, Indian paper mill workers receive only one-fifteenth to one-twentieth of what their American equivalents, for example, are paid. These two conditions suggest the conclusion that labor costs per unit of output can be considerably lower in India than in the West (and especially in America) if the mills are reasonably well equipped and if they avoid carrying large numbers of surplus workers.[1]

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[1] Investment in India, op. cit., p. 90.

The rate at which the skill and effectiveness of Indian paper workers is enhanced in the future probably depends as much on the performance of mill managements as on any other factor. In the areas of employee relations and the utilization of its labor resources, as in other aspects of its operations, the greatest need of the paper industry is for enlightened and forceful leadership. Some indication of the type of leadership which the leading mills have received in the past will be given in the next chapter.

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[1] Confirmation of this conclusion is indicated by the wage and salary figure for Mill "C," in Table VIII of Chapter 4, which amounts to only 6 per cent of manufacturing costs.

CHAPTER 9

Case Histories of Growth and Entrepreneurship

In the foregoing chapters, the development of the paper industry has been analyzed in terms of the functions which it performs and of the personnel who execute these functions. It seems appropriate at this stage to supplement this approach with an historical appraisal of the growth of Indian paper making and with an examination of the individuals and of the factors which have most vitally affected that growth. As was noted earlier, the industry was overwhelmingly dominated by British managed firms for the first three-quarters of a century of its existence. Beginning in 1936, however, and continuing to the present day, a new pattern has been taking shape with initiative and leadership passing more and more into the hands of Indian controlled companies. To illustrate the contributions of British paper makers to the development of the industry, the careers of the Titaghur and Bengal Paper Mills have been traced below. To indicate the contrasting nature of rising Indian leadership, a second dual case study relating to the paper interests of Karam Chand Thapar and Brothers, Limited, and of Birla Brothers, Limited has been added. As a concluding sequel to these two success stories, a third study concerning the unhappy record of the Nepa project has also been included.

The Titaghur and Bengal Paper Mills were both established during the 1880's by members of the British business community in Calcutta. Both were the offspring of managing agency firms and both remain today under the same managements they had in 1890. Balmer Lawrie and Company has managed the Bengal unit since its inception while F. W. Heilgers and Company has held control of Titaghur since 1886, when its first manager had to resign for lack of funds.[1] These two firms were founded at a time when the outlook for Indian papermaking seemed very promising. During the same period four other mills were erected and the capacities of two pre-existing units were expanded. The direct incentive to this development was the Government's announced policy, beginning in 1881, of giving preference to Indian made articles. However, as noted in Titaghur's company history:

> The sudden development of the Indian industry... could not have occurred but for the general conditions which prevailed elsewhere. A vast expansion in paper manufacturing facilities had been rendered necessary because of the enormous demands resulting from the introduction of compulsory education in Europe and America. World prices were therefore high and in this fact lay India's opportunity.[2]

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[1] In recent years, the operations of F. W. Heilgers have been coordinated with those of another large managing agency, Bird and Company, Limited. As a result, the combined agency is generally referred to as Bird Heilgers even though the two firms have retained their separate corporate identities.

[2] Titaghur Paper Mills Company Limited, "Historical Note" in Jubilee Souvenir, Calcutta: July 27, 1932, p.2. Information on the history of the Bengal unit is to be found in The Bengal Paper Mill Company Limited, Diamond Jubilee Brochure, Calcutta: January 28, 1949.

The opportunity turned out to be a fleeting one when Western technologists discovered the secret of making cheap paper from woodpulp in the latter part of the nineteenth century. Imports of this paper first reached India in 1895, and by 1900 they had become so large as to threaten the existence of the indigenous industry, which utilized rags, wastepaper, mill cuttings, and local grasses as raw materials. By 1905, two of the country's leading paper firms, the Royal Paper Mills at Bally and the Imperial Paper Mill Company at Kankinarah had become insolvent and had sold their assets to Titaghur. The Bengal mill had fared only slightly better but had managed to survive by writing down the value of its capital by 67 per cent and by "joining hands with Titaghur in regulating production and the purchase of supplies."[1] The latter organization was obviously less hard pressed than its rivals. During this period of adversity for the industry, it managed to pay 5 to 7 per cent dividends, to triple its output, and to emerge with control of two-thirds of domestic industry's paper making capacity. Its success is apparently attributable to bold and aggressive leadership which was prepared to take risks and to invest funds in times of crisis, while concurrently producing the whitest paper made in India. This leadership appears to have come, not from any one outstanding entrepreneur, but from a number of able professional managers who directed the affairs of F. W. Heilgers during the latter part of the nineteenth and early years of the twentieth centuries.

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[1] Titaghur Paper Mills Company Limited, "Historical Note", *op. cit.*, p.5.

From 1905 until 1915 the Indian paper industry remained virtually static and, but for the preference it enjoyed in receiving government orders, would certainly have declined, if not expired. Titaghur and Bengal continued to share between them from 80 to 85 per cent of the market for domestic papers and to supply about 35 per cent of total Indian consumption. With the advent of the first World War and the gradual shutting off of imports from Europe, Indian mills found themselves in a seller's market and they made the most of it. Beginning in 1917, the Bengal Company began paying dividends of 52 per cent on the book value of its ordinary shares and continued doing so through 1920. Titaghur's dividends did not reach the 50 per cent level until 1918 but remained at or above that figure for three years.[1] This bonanza came to an abrupt and disastrous end in 1921 when a world trade depression combined with an increase in the rupee exchange rate brought a flood of European paper into the Indian market. Both Titaghur and Bengal found themselves in straitened circumstances to the point where Titaghur was forced to reorganize and to write down its capital by 75 per cent, while Bengal went for four years without paying a dividend on ordinary shares. Their distress was relieved once again by the Government which, in 1925, was persuaded to place a protective duty

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1. These figures were taken from the semi-annual financial statements of the two companies in question for the years indicated. It will be remembered that the book value of the Bengal Company's ordinary shares had been written down by 67 per cent in 1903.

on imports of printing and writing papers. In making its recommendation for protection, the Indian Tariff Board took a sharp look at the industry and declared unequivocally that it would never be able to stand on its own feet so long as it depended for its primary raw material on local grasses which were both expensive and short in supply. It proposed, therefore, that the papermakers be shielded from external competition for a sufficient time only to permit the development of a bamboo paper industry.[1]

The use of bamboo for the making of paper had been suggested as early as 1875 by an Englishman named Thomas Routledge, but his proposals were not accorded much attention for another twenty years. In the late 1890's another Britisher named William Raitt, who was at that time the mill manager of the Bengal Paper Mill Company, succeeded after extensive experimentation in developing a workable process for the pulping of bamboos. To illustrate his ideas, he rigged up a small pulping unit which he took to various durbars[2] in the hope of attracting official support. His enterprise is said to have succeeded ultimately in gaining the attention of the Viceroy and in bringing about the establishment of the Pulp and Paper Section of the Forest Research Institute. Raitt's work does not appear to have impressed his superiors in the Balmer Lawrie agency, since it is reported that they discharged him for inefficiency shortly after the turn of the century.

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[1] Report of the Indian Tariff Board, 1925, op. cit., "Conclusions".

[2] Durbars were large ceremonial gatherings attended by princes and high officials from all parts of the country.

From the Bengal Mill he went to the Forest Research Institute where for the next three decades he labored tirelessly on the perfection and publicizing of a bamboo pulping process. At the Institute his technical research was complemented by the work of an able economist and administrator, R. S. Pearson, who made detailed studies of material sources and production costs and showed that the making of paper from bamboo was economically as well as technically feasible.[1]

Although the Titaghur Mills cooperated fully with Raitt and Pearson in 1912 in carrying out their experiments, neither it nor the Bengal Mill got beyond the planning stages in exploiting the possibilities of making bamboo paper for another fifteen years. In what was to become the most important development, not to mention the salvation of the Indian paper industry, initiative and leadership came almost entirely from government experts. Even after the imposition of the paper tariff in 1925, the managements of the major mills did not begin to utilize bamboo but sought instead to improve the financial positions of their concerns by manufacturing an increased proportion of their paper from imported woodpulp.[2] It was not until the Government discouraged this practice by placing a duty on pulp imports in 1931 (see Table XII, Chapter 6) that Titaghur and Bengal began commercial scale production of bamboo pulp. In fairness to these two firms it should be pointed out that for much of the period from 1912 to 1932 they were too impoverished to have sustained without external help large new investments in plant and equipment.

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[1] For a more comprehensive history of early research on bamboo papermaking, see Pearson, R.S., Note on the Utilization of Bamboo for the Manufacture of Paper Pulp, Indian Forest Records, Vol. IV, Calcutta: Superintendent of Government Printing, 1913.

[2] The India Paper Pulp Company, backed by a Scottish publishing firm, Thomas Nelson and Sons, had engaged from 1922 onwards in the manufacture of paper from bamboo by the sulfite process with limited success. The method developed by Raitt was a modification of the soda process and a forerunner of the present semi-sulfate process.

The conservatism of these firms was not only technological in its nature. Despite their protected market, it is said that in the late 1920's and early 1930's they joined with the India Paper Pulp Company in an agreement not to increase capacity--a statement which is born out by their respective production records from 1928 through 1932. Under this relatively static situation, dividend payments of both Titaghur and Bengal began to soar and to attract the attention of Indian businessmen. When the latter reacted by founding four new paper companies in 1936, the Titaghur management expressed its apprehension to its shareholders in these words: "The customs statistics show that the market for protected qualities is restricted and that there is little scope for expansion."[1] Concurrently the firm paid a dividend of 65 per cent on the (reduced) book value of its ordinary shares.[2] Despite its forebodings, Titaghur did increase its output, by about 9 per cent per year from 1932 to 1939, whereas Bengal's production remained constant over the same period.

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[1] Titaghur Paper Mills Company Limited, Report and Accounts for the half-year ending September, 1936, p. 5.

[2] Investor's India Yearbook 1937, Calcutta: Place, Siddons and Gough, 1937. In Indian publications, dividends are always listed as percentages of book or face values of shares.

Increasing competition from the new Indian mills precipitated a price war in 1938 and 1939, but this was quickly terminated by the advent of World War II. The war years were characterized in all mills by maximum volume production, high profits, and the postponement of maintenance and repairs. The seven fat years from 1940 through 1946 were followed by three lean ones during which political unrest, geographic partition, labor disturbances, raw material shortages, and repair problems combined to bedevil all manufacturers and to reinforce the conservative attitude of British paper mill managements. This attitude has caused these managements to play safe in recent years, with the result that they have failed to claim their proportionate share of the opportunities for new enterprise in the paper making field. On the other hand, they have not been entirely quiescent.

Financing itself entirely out of its wartime reserves and its undiminished postwar profits, Titaghur installed one new paper machine in 1950 and increased its 1952 output by 25 per cent over 1945 levels. Under pressure from the Government of Orissa (whence it gets most of its bamboo) to build a mill there, this company is reputed to have agreed reluctantly in 1953 to erect a small mill (equipped with a second-hand paper machine) in that state. The competent and complacent managers of Titaghur today seem a far cry from their aggressive predecessors of one-half century earlier.

Unwilling either to borrow money or to issue new shares, they have expanded their mills' capacity in small stages only - an admittedly expensive way of growing in the paper industry. Reluctant to rationalize production and to retrench surplus workers, they have permitted labor productivity to fall from 9 tons of paper per worker in 1939 to 6.6 tons in 1952, a decline of about 27 per cent.[1] Unprepared to adjust to the post-war labor situation they have suffered repeated strikes and slowdowns culminating in 1953 and 1954 in a six month work stoppage, the "longest labor strike in the recent history of Bengal's trade union movement."[2] Despite these shortcomings, Titaghur continues to make a good grade of paper and an even better grade of dividends. It also continues to enjoy the public reputation of being the undisputed standard bearer of India's paper industry.

The Bengal Paper Mill Company has fared less well than Titaghur in the post-war era but has paid high dividends, nonetheless, in all but two recent years. Its plant having been permitted to deteriorate for a decade or more, the company was forced into a major reconstruction program beginning in 1946. At the same time, its managing agents undertook to build and to operate for the British-American Tobacco Company a new mill for the manufacture of cigarette papers. This unit, organized as Tribeni Tissues Limited, was originally designed as a six machine mill which was expected to serve most of the Orient. The elimination of China as a potential market caused the scale of operations to be reduced considerably with consequent adverse effects on the costs of production. This firm operates the only paper mill in India which depends heavily on export markets for its business. Up until 1952 it was scarcely able to meet expenses but since that time it has enjoyed an expanding market and a favorable international reception for its product. The managers of Tribeni attribute their success in selling outside of India to their insistence on high standards of quality. Their ability to overcome poor quality, which has long been one of the historic impediments to the sale of Indian paper abroad, is not without its significance to the rest of the industry.

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[1] These productivity figures were derived by dividing total annual output by total number of workers, as reported by the company. From the standpoint of labor productivity, 1939 was Titaghur's best pre-war year and 1952 its best post-war year. Employment figures for 1939 were found in Government of India, Large Industrial Establishments in India, Calcutta: 1941, p. 102. Employment figures for 1952 were obtained from the Government of India, Labour Bureau, April, 1954. Output totals were obtained directly from the company.

[2] The Times of India (New Delhi), March 25, 1954, p.1.

Tribeni Tissues is the child of a partnership in which the tobacco company supplied the money and a good share of the market while Balmer Lawrie furnished the plans, the site, the supervision, and a certain amount of experimental research. In assuming the managership of this new unit along with that of the Bengal Mill, the agency has been able to achieve certain increases in flexibility and in efficiency of operation, combined with reductions in supervisory and overhead costs.

The Bengal unit itself has now undergone a drastic overhauling of its equipment, supervisory staff, and labor force, and although it had not achieved since 1945 a level of production equal to that of the war years, it should do so in 1954. Its health has been restored but its importance in the industry has declined sharply. Having been for forty years prior to 1944 the third largest mill in India (both Titaghur units were larger) it has now fallen to eighth place in that ranking. Bengal's declining proportion of total Indian paper output is illustrated in Table XIII which also shows the changes which have taken place over the past forty years in the shares produced by other major manufacturers.

TABLE XIII

DIVISION OF INDIAN PAPER PRODUCTION BETWEEN MAJOR MANUFACTURERS, 1913 to 1953 (a)

Agency (Mill)	1913	1923	1933	1943	1953
F. W. Heilgers (Titaghur - 2 Mills)	63 %	59 %	48 %	30 %	25 % [b]
Balmer Lawrie (Bengal, Tribeni)	23 %	25 %	24 %	12 %	8.5 % [b]
Birla Brothers (Orient, Sirpur)	--	--	--	9 %	25.5 %
Karam Chand Thapar (Shree Gopal, Ballarpur)	--	--	--	8 %	10 %
Others	14 %	16 %	28 %	41 %	32 %

(a) Percentage figures shown here were calculated from physical production totals for each firm and for the whole industry. Percentages for 1953 were derived from data made available to the writer by the Planning Commission (see Table I, Chapter I). Figures for 1943 were derived from the *Report of the Panel on Paper*, *op. cit.*, p. 36. Percentages for earlier years were calculated from output totals for respective mills given in Indian Tariff Board, *Evidence*, *op. cit.*, for the years 1925 and 1938.

(b) These figures would probably have been 2 or 3 percentage points higher but for strikes in these firms in 1953.

The founding in 1936 of the Shree Gopal Paper Mills Limited and of the Orient Paper Mills Limited marked the respective entries into the paper making industry of the managing agencies of Karam Chand Thapar and Brothers, Limited, and of Birla Brothers, Limited. The Thapar organization was a relative newcomer to the managing agency arena, having been established only in 1929. Its founder, Lala Karam Chand Thapar, is said to have come to Calcutta with slender resources from his home in the Punjab, in 1927, and to have gone into business as a coal dealer. He soon became the owner of a number of coal mines and then expanded his holdings to include other activities such as sugar refining and paper making. Although he received financial support from his brothers and from several Punjab merchants, Mr. Thapar built his organization singlehandedly into the imposing network of companies which comprise it today. Through a combination of energy, shrewdness, risk taking, and luck, he has assembled a personal industrial empire in the classic entrepreneurial tradition.

Although the Birla Brothers managing agency antedates its Punjabi counterpart by several decades, it did not achieve great importance until World War I. Beginning at that time, the firm grew rapidly and enlarged its holdings in many fields, the foremost of which were textile, jute, and sugar mills. Top leadership in Birla Brothers is still provided by one man, B. M. Birla, but the active running of the enterprise has mostly been taken over by sons, newphews, and in-laws, between whom are divided the agency's many departments and interests. It is therefore essentially a family organization as contrasted with the individualistic Karam Chand Thapar operations.

The establishment of new paper companies by the Birla and Thapar agencies was part of a sudden revival of enterprise in the paper industry which was reminiscent in some ways of the period of growth at the end of the previous century. Conditions favoring expansion included the existence of a protected market which promised to grow with increasing literacy, a feeling of business confidence in the country, and evidence that the technical problems of making paper commercially from bamboo had been solved. The direct incentive which brought five new concerns into existence in 1936 and 1937 was the very high and ascending rate of profits shown by the Titaghur and Bengal mills from 1932 onwards.[1]

The first of the new firms to go into production was Karam Chand Thapar's Shree Gopal Mills which commenced operations in April, 1937. Located close to the sabai grass areas of northern India this unit had formerly been the ill-fated Punjab Paper Mills which had been built a decade earlier, had operated for ten months, and had then gone into liquidation. The failure of this earlier mill has been attributed to many causes, foremost among which were dissension within its management and lack of working capital.[1] Its bankruptcy in 1929 had served to confirm the convictions of the managers of the Titaghur and the Bengal Paper Mills that the Indian market could not absorb increased output. In taking over the complete plant and machinery of the defunct Punjab Mills, Mr. Thapar had been successful in outbidding the rival Star Paper Mills concern for the mill property but had lost out to them on rights to take grass from the surrounding areas. In consequence, Shree Gopal began its existence handicapped by a very serious raw material supply problem.

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[1] These profits ranged from 20 to 25 per cent of the face value of common shares for Bengal and from 35 to 55 per cent for Titaghur. The other three new firms were the Mysore Paper Mills, the Star Paper Mills, and the paper mill branch of Rohtas Industries. The first of these was organized by the government of the state of Mysore. The latter two were founded by business families belonging to the Marwari community.

The handicap which faced Birla Brothers' Orient Paper Mills during its first year of operation was of a different sort. This was a new mill, almost entirely of German manufacture, which is reputed to have been purchased at bargain prices at a time when the Germans were seeking foreign exchange to implement their rearmament program. It began operation as the only kraft paper mill in the country in February, 1939,[2] and shortly thereafter saw its entire staff of German technicians and advisors interned for the duration of the war. Production suffered considerably until other technicians could be brought in to replace the internees.

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1. See Indian Tariff Board, Evidence 1932, op. cit., p. 640

2. Kraft paper is a strong type of paper made from sulfate pulp. It is usually brown in color and is used for wrapping and packaging.

By 1939 all five of the newly established mills had come into production, flooding the market with more paper than it could absorb, precipitating price wars, and filling warehouses with accumulations of unsold stock.[1] It is now generally agreed that several of these new firms were saved from bankruptcy by the outbreak of World War II, in September, 1939. Within a year from the beginning of hostilities the paper surplus had disappeared, and within another year shortages had developed. The objective of every mill became that of getting the maximum volume of production out of its machines. Quality suffered in all units--some say to a greater extent at the hands of the new firms than of the older ones.

The shortage had become quite critical by 1942 when the Government suddenly decided to requisition 90 per cent of the country's output. The resulting black market conditions in the private sector were so serious that the Government was compelled, first to reduce its quota to 70 per cent, and later, in 1944, to institute a complete set of controls over production, distribution, and prices. These controls remained in effect until 1950.[2]

In the immediate post-war years the Indian managed firms appeared no more anxious than their British controlled rivals to engage in large scale expansion schemes. They too were afflicted by the economic and political dislocations of 1946 and 1947 and were not untouched by fears of nationalization. Perhaps because of their close connections with the ruling Congress Party, Birla Brothers were the first to shed their doubts and to begin increasing the capacity of their Orient Mills. In 1948 they installed a third small paper machine and in 1950 they doubled the mill's capacity (to 30,000 tons) by erecting a large, high speed, Swedish machine for making printing and writing papers. Since 1951 they have installed much additional equipment, including India's first Tomlinson furnace, so that today Orient is the largest and probably the lowest cost paper producer in the country. Further plans to raise this unit's output to 50,000 tons appear to have been deferred, possibly because of seasonal water shortages at the mill site.

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[1] For an illustration of the growth of output during this period, see Fig. 1, Chapter 1.

[2] All-India Printer's Conference, op. cit., p. 29.

The post-war growth of the Shree Gopal Mills has been at a slower, more gradual, and considerably cheaper rate than that of Orient. Karam Chand Thapar's policy of spreading his finances thinly over a proliferating family of enterprises has ruled out large, lump sum investments. In addition, a serious problem of raw material shortages in north India has limited both the rate and the extent of expansion. Despite these handicaps, Shree Gopal's output has been increased at a rate of about 10 per cent per year from 1948 through 1953. This expansion of output has been accomplished at moderate cost and without increasing the capital of the company by speeding up existing machines, eliminating production bottlenecks, buying and rejuvenating second hand equipment, and by raising the efficiency of plant personnel. Unlike the Orient Mills, Shree Gopal's operations appear to be fairly labor intensive.

However, figures on labor intensity and labor productivity at Shree Gopal cannot be determined precisely since the work force at this mill includes men engaged in other than paper making activities, including stationery manufacture and the hydrogenation of vegetable oils.[1]

Since April of 1951 Karam Chand Thapar has been the managing agent of a second paper unit, the Ballarpur Paper and Strawboard Mills Limited. This firm, founded in 1945 as a private company, had undertaken to build a mill in southern Madhya Pradesh with the assistance of the government of that state. In 1949, when the initial managing agents found themselves unable to meet their financial obligations, the state assumed control and subsequently appointed Thapar and Brothers as managers. The latter supervised the erection of the new mill, a small, modern, Canadian built unit, and got it into production in November, 1953. The assistance furnished by the Shree Gopal Mills in this operation consisted in supplying a cadre of skilled technicians and paper makers and in purchasing one million rupees worth of Ballarpur's ordinary shares.[2]

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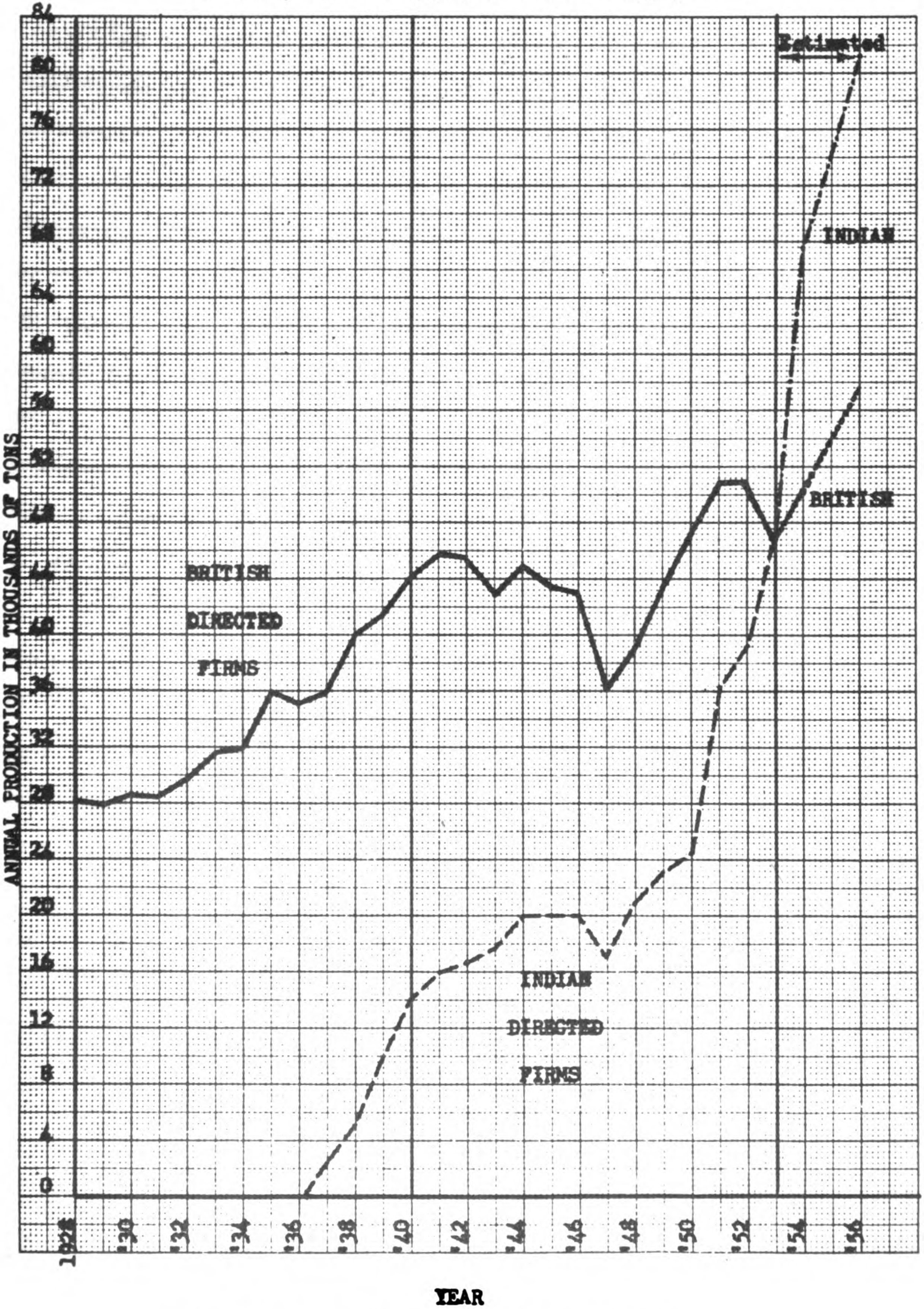
1. In February, 1954 the articles of association of the Shree Gopal Mills were amended to permit the company further to diversify its activities to include such lines as paint, and drug manufacture, saw mill operation, textile spinning and dyeing, and the preparation of food products. It was claimed that the purpose of such variegation of functions was to use Shree Gopal's successful reputation as a means of raising capital for ventures into new fields of activity.

2. When Karam Chand Thapar was having difficulty in raising capital for Ballarpur he asked all would-be distributors of Ballarpur paper to purchase shares in return for local distribution rights. This technique is said to have netted an additional Rs. 1.5 million in share subscriptions.

In March, 1953, Birla Brothers Limited became the third managing agency to assume direction of a second paper firm when it took over the Sirpur Paper Mills in the state of Hyderabad. Founded as a state enterprise in 1939 by Mir Laik Ali, former Prime Minister of Hyderabad, the Sirpur firm had operated quite successfully in that capacity from 1943 until 1949. In the latter year, the so-called "police action" of the Indian Government against the Nizam of Hyderabad threw the mill into chaos from which it had not fully recovered four years later. When Birla Brothers took over, they brought in a reputed three hundred men from the Orient Mills and set about implementing existing schemes for tripling the size of the mill (from 5,000 to 15,000 tons per year). By virtue of this expansion, the firms under Birla Brothers' management have become the largest paper producers in India surpassing Titaghur in volume of output, if not in quality or prestige.

In taking over direction of the Ballarpur and Sirpur Mills respectively, Messrs. Thapar and Birla have not been able to integrate the operations of these newly managed units with those of their older paper mills in the manner that would be possible if each pair of mills were under the same ownership. The chief obstacles to such integration are the separateness of the stockholder interests of each of the managed companies and the extent of state ownership in both the Ballarpur and Sirpur Mills. To date these new units have

FIG. 5 COMPARATIVE PRODUCTION RECORDS OF LEADING PAIRS OF BRITISH DIRECTED AND OF INDIAN DIRECTED PAPER MANUFACTURERS IN INDIA, 1928 TO 1953 (PROJECTED TO 1956)[a]



(a) For footnote, please see following page received considerable assistance from the older ones in the same agency, but it is difficult to see how the shareholders of the latter (other than the managing agent) can have been happy about this use of their resources to build up a firm in which they have had no financial interest. Many of the principal economies of horizontal integration: standardization of products, rationalization of marketing, specialization of functions, and pooling of financial resources appear to be achievable only to a very limited extent under present conditions by these pairs of firms. Nonetheless even such partial integration of functions as has been possible is

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Footnote to Fig. 5. The pair of British directed firms whose consolidated production totals are shown here are F. W. Heilgers Limited and Balmer Lawrie and Company Limited. The Indian directed firms are Karam Chand Thapar and Brothers Limited and Birla Brothers Limited. As indicated in the text, these concerns are not paper manufacturers per se but are agency houses, each of which manages two paper mills. Production tonnages for the first three firms and for Birla Brothers since 1950 were obtained from the central offices of the agencies. Projections for all of the companies from 1954 through 1956 are the writer's estimates based on scheduled capacity increases.

Output data for the Orient Mills (Birla Brothers' only paper mill prior to 1953) were extracted from the following sources: For the years 1939, 1940, 1946, and 1949 from the Statistical Abstract India, Calcutta: Government of India Press for the appropriate years; for 1943, from the Report of the Panel on Paper, op. cit., p. 36; and for 1944, from the Report of the Indian Tariff Board 1947, op. cit., p.8. Production totals for the years 1941, 1942, 1945, 1947, and 1948 having been unavailable, the writer was forced to make his own estimates based on knowledge of overall output trends in those years. These estimates could be in error by as much as 2,000 tons but such errors would not appreciably affect the growth pattern shown here.

a step toward more efficient and lower cost paper production in the future.

In Figure 5 the combined annual production totals of the F. W. Heilgers (Titaghur) and Balmer Lawrie mills are traced since 1928 and are compared with similarly combined output figures for paper mills managed by Karam Chand Thapar and by Birla Brothers. Projections for 1954 through 1956 are estimates based on scheduled capacity increases. This graph shows that while the two Indian firms have been growing more rapidly than the British concerns since 1937, it is only since 1950 that the ascendancy of the latter has been seriously challenged. In 1953 the two groups stood almost even, but judging by expansion schemes now in progress, it appears that by 1956 the Indian managed firms will have a distinct superiority in volume of production.

The foremost reason why the Thapar and Birla enterprises have moved ahead more rapidly in the paper making field than have those of Heilgers and Balmer Lawrie is that the managers of the former have been more energetic, aggressive, and willing to take financial risks than have the directors of the latter. The Indian firms were prepared to gamble on the growing demand for paper both in the late 1930's and in the early 1950's to a much greater extent than were their Western managed counterparts. They did not limit themselves to the expansion they could achieve out of their own resources but made much of their growth on borrowed money. Their financial policies have not been such as would appeal to a conservative banker, but under conditions prevailing in India, they have succeeded remarkably well.

Part of the success of the Orient Mills can be ascribed to its favorable location[1] and to its heavy investment in modern equipment. The same statement cannot be made about Shree Gopal which has achieved growth and prosperity with a disadvantageous mill location and with very little new equipment. It has done so not only because of the financial acumen of Karam Chand Thapar but also because it is one of the best run mills in India. At Shree Gopal, the men get more production per unit of investment than do those of any other mill, while at Orient the equipment yields more output per unit of manpower than is the case in any other domestic unit.[2] Both firms make good but sparing use of foreign technicians, both make generous provision for employee welfare, and both enjoy relatively peaceful labor relations. The British managed firms score less well on all of these points and especially in regard to labor relations. Their failure to develop satisfactory union-management relationships has cost them many thousands of tons of lost production since 1946, and this in turn has been a factor in deterring their expansion. Other factors, as recorded earlier in the chapter, have contributed to (or retarded) the growth of the individual firms but those cited here appear to be the most important ones which are generalizable to two or more companies.

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[1] Orient's location in northern Orissa places it close to rich bamboo forests and only three miles from a source of coal. It is also strategically situated with respect to major market areas.

[2] For evidence to support these contentions see Table II, Chapter 2.

A shorter and less happy record of industrial growth was that experienced by the National Newsprint and Paper Mills Limited, India's first and only newsprint mill.[1] The Nepa project was organized in 1947 by a Bombay promoter and publisher, Mr. Pran Nath Nair, and his wife. Unable to get newsprint for their publications and aware of the large sums of foreign exchange expended by Indians each year for this commodity, the Nairs proposed to build a 30,000 ton (capacity) mill to make newsprint using salai wood, a domestic hardwood which was said by experts at the Forest Research Institute to be technically suitable for this purpose. Both salai for groundwood pulp and bamboo for the necessary supplement of chemical pulp were available in Madhya Pradesh, and the government of that state was anxious to encourage the establishment of a mill to utilize them. The M. P. government supported the new venture by subscribing for one million rupees of Nepa shares and by accepting additional shares in return for concessions for land, water, and raw materials. A year later the state was obliged to put up an additional five million rupees when Mr. Nair found himself unable to raise this amount in the open market.[1]

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[1] Except as otherwise indicated, data on the Nepa project are based on: (a) a visit to the mill and talks with key management personnel; (b) an interview with Mr. C. A. Harwick, Industrial Engineer, Ebasco Services Inc., in New York, June 1953; (c) newspaper articles including "Progress in India's Maiden Newsprint Venture in M.P." Amrita Bazaar Patrika. February 28, 1954, p.IV; and numerous discussions of this project with paper makers and paper merchants.

Early in 1948 Robert Rankin, the Canadian consultant whom Mr. Nair had engaged, came to India and selected the mill site. Unfortunately, he was misinformed as to the flow of water available in the dry season from the nearby Tapti River and he failed to verify this faulty information. In consequence, the mill came to be situated in a place where there was insufficient fresh water for its needs during three or four months of a dry year and where there was no adequate means of diluting its effluent at any time. After his inspection, Ranking submitted a ten million dollar (Rs. 33.2 million) estimate for the cost of the whole scheme. Since, even before the Sterling Area devaluation of 1949, this amounted to two and one-half times the subscribed capital of the new company, Nair began looking for a consulting firm which would do the job for less. He found one in Ebasco Services, Incorporated of New York, whose representatives, like Rankin, failed to check the information given them before agreeing to do the job and submitting a tentative cost estimate. Ebasco's estimate was appreciably lower than Rankin's but was still well above the resources of the young company. Nonetheless, Nair went ahead with orders for mill machinery. When he found that he could not raise the capital to pay for this equipment and that imminent devaluation was going to make matters worse, he turned to the Madhya Pradesh government for further assistance. This state thereupon investigated the company's finances and, finding "numerous instances of wastefulness and mismanagement"[1] relieved Nair of his position in October, 1949. Unable to provide the additional funds required out of its own revenues, Madhya Pradesh called on the Central Government for aid. The latter promised to loan the necessary money to the state.

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[1] Government of Madhya Pradesh, Directorate of Information and Publicity,"State Aided Concerns in Madhya Pradesh: The Shroff Committee Report on the Nepa Mills", (an unpublished report), Nagpur: May 29, 1951. For accounts of the history of the Nepa project see also The Nepamills, op. cit., pp. 4-10, and Nair, Kusum, "There's Business in India", Fortune, February, 1949, p. 87 ff.

Meanwhile, on the advice of a special committee which had been appointed to investigate the soundness of the project, the Madhya Pradesh government began looking for a qualified managing agency to take over direction of Nepa. In 1950, it entered into protracted negotiations with Birla Brothers, while work on the mills virtually ceased. By the time the state had rejected Birla's last offer and had decided to complete the project under its own direction, the Korean War crisis had given a further boost to the expense of the scheme. Ebasco's cost estimate of Rs. 29.8 million made in May, 1949 had had to have two upward revisions and by 1952 had reached Rs. 60 million, which was about four times what Pran Nath Nair originally claimed it would cost.

The shortcomings of the Nepa project have not all been of financial origin. It is now apparent that two erroneous assumptions were made when it was decided to place the mill in its present location. The first of these, as already mentioned, was that there was sufficient sustained flow to the Tapti River. The second was that the surrounding forests of _salai_ wood were capable of being converted into satisfactory newsprint in sufficient quantity to keep the mill going indefinitely. The water supply problem is believed to have been overcome, at a cost approaching two million rupees, by the construction of a small dam across the river. The raw material problems have not yielded so readily to solution.

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[1] "The Shroff Committee Report," op. cit.

Recent tests have shown that _salai_ wood turns brown during the three months of the monsoon season and cannot therefore be harvested for pulp during that period. In addition, it is claimed by some informed paper men that the _salai_ forests are so sparse in growth that they will be completely consumed by the mill long before they can be replaced by natural growth. To counter both of these difficulties, experiments have been conducted in attempts to find faster growing, whiter pulping substitutes for _salai_. It seems possible from a technical standpoint that such a substitute has been discovered in the _maharukh_, an Indian species of the ailanthus family. However, no one has yet shown how the _salai_ forests can be replaced by _maharukh_ at a cost low enough and on a scale large enough to sustain the full requirements of the mill for pulpwood.

When the Nepa mill goes into production - scheduled for late 1954 - it will be the best equipped and most modern unit in India, second in size only to the Orient Mills. However, because of its high capitalization costs and of its raw material problems, there are few people in the Indian paper trade who think it will prosper without special assistance from the government. By Nepa's own figures, completion of the project will entail a total government loan of Rs. 47 million. Interest on this sum, calculated at 4 per cent and divided by an expected annual output of 27,000 tons, would amount to Rs. 70 per ton. Added to this sum would be accumulated unpaid interest to date plus the return on necessary additional loans for working capital.[1] To place this mill on a paying basis commercially, it may be necessary to reduce the rate of interest on government loans or to write off part of the debt total. The central and state authorities can, if they choose, do either of these things. It is not so certain that they can do what is perhaps more necessary to the success of the Nepa scheme, namely, equip the mill with a skilled and permanent supervisory staff who have a vital concern with the success of the project.

Even without a major reorganization of its financial structure, the National Newsprint Mills could become a paying proposition. An upward shift in world newsprint prices would improve the chances of such an outcome appreciably. It is possible also that an economical means of bringing pulpable softwoods down from the Himalayas may be developed before supplies of salai and maharukh are exhausted, and that a solution to problems of discoloration may soon be found.

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[1] See The Nepamills, op. cit., p.41. The allowance for working capital in the official project cost estimates is only Rs 6.3 million, or 10.5 per cent of total costs. This sum is far below what the mill will require for operating purposes.

Should the project fail as a newsprint venture, the Government will probably convert the mill into a unit for making kraft and other papers. If it does so, it will have fostered a useful addition to the nation's paper making capacity in a unique and expensive manner.

The examples of paper mill development cited in the foregoing pages have included all but one of the major producers in the country. That one is Rohtas Industries, India's chief manufacturer of paper boards. This mill, which had an output of 12,700 tons in 1953 was expected to increase its capacity to 28,800 tons by 1956.[1] The operating policies and the growth pattern of this concern have not been dissimilar to those of the Shree Gopal and Orient Mills. Among the ten other paper firms whose development has not been discussed, growth has been slow, with entrepreneurial activity sporadic and unsustained. Three of these units have expanded appreciably since 1946, but none has grown out of the small and probably uneconomic mill category. Although it is possible that one or more of these small firms will ultimately achieve increased prominence and that new firms of potential importance will enter the paper making picture within the coming decade,[2] it is to the larger concerns now in operation that the industry must currently look for leadership and progress. The opportunities for leadership and the potential for progress in indigenous paper manufacturing are considered in the chapters which follow.

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[1] This figure was obtained from the Planning Commission in April, 1954.

[2] Since 1946, there have been a number of unsuccessful attempts to establish new paper mills in India. Most of these attempts never got beyond the planning stage, the chief obstacle having been lack of financial resources. How many of such schemes were sufficiently sound, technically and economically, to have justified financial backing is not known.

PART III

The Growth Potential

CHAPTER 10

Demand and Resources

In the nine preceding chapters of this study the growth of the paper industry has been discussed in terms of factors which have played significant roles in determining the rate and the direction of that growth. Most of these factors have been related to the supply side of the picture but little has been said thus far about demand. In the ensuing pages the subject of anticipated demand for paper in India and surrounding regions will be analyzed in the light of expected increases in levels of population, of literacy, and of per capita income. Following this discussion of future consumption trends, the balance of the chapter will be concerned with the general question of whether indigenous paper making resources will be adequate to meet the growth in demand which is foreseen. Included in this evaluation of resources will be such factors as capital equipment, finance, and human skills as well as raw materials, chemicals, water supply, and power.

The growth of Indian demand for paper over the past quarter of a century is roughly indicated by the consumption figures for newsprint and for paper and paperboard which are graphed in Figure 6.[1]

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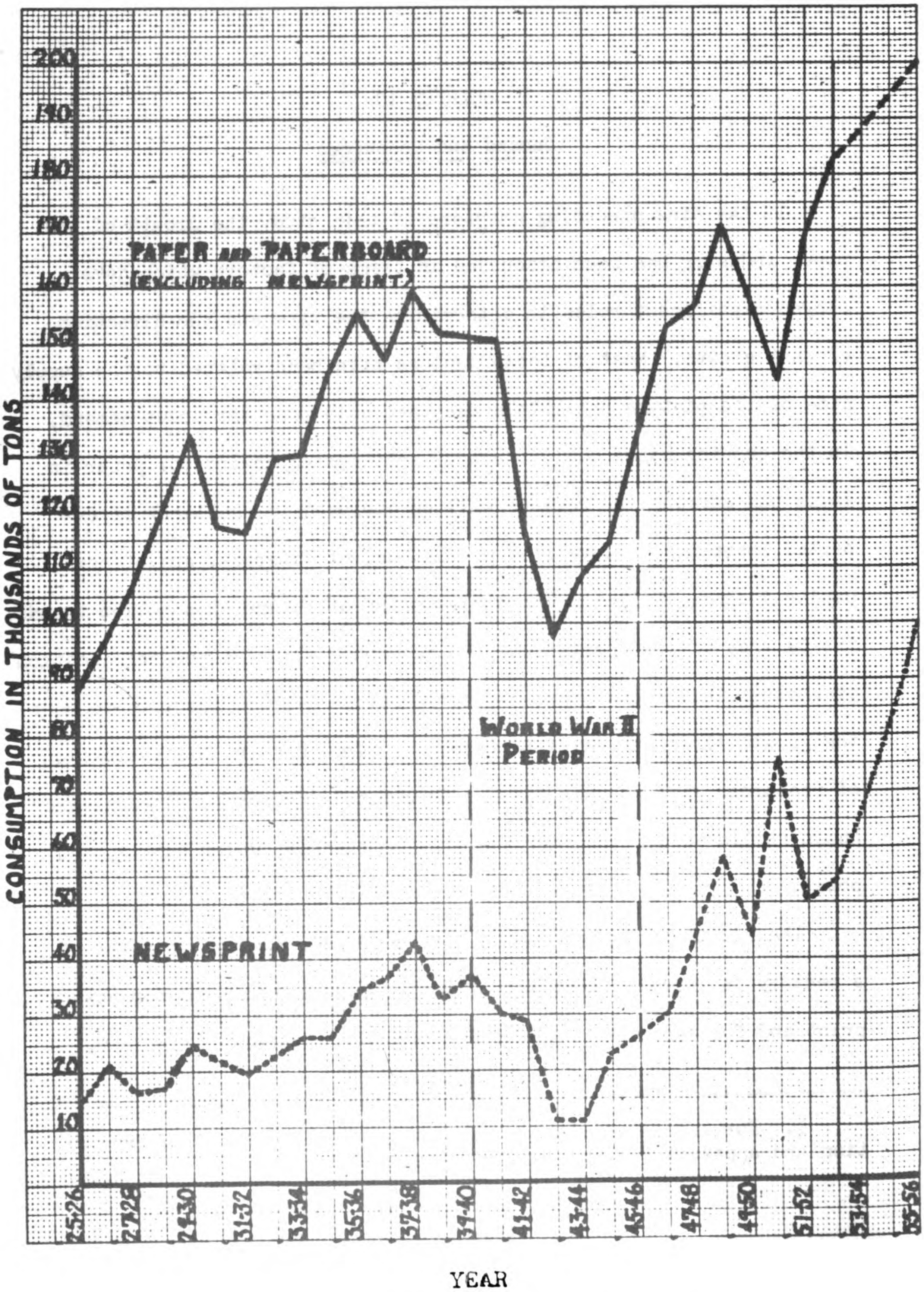
[1] For annual physical totals of imports and exports, production and apparent consumption, see Appendix II A.

FIG. 6 INDIAN CONSUMPTION
OF PAPER AND PAPERBOARD AND OF NEWSPRINT
1925-26 TO 1952-53 (PROJECTED TO 1955-56)[a]



(for footnote, see following page)

The usefulness of these two time series for projecting future trends is impaired by two limitations. The first of these is that they include consumption figures for Burma prior to 1937 and for Pakistan prior to 1947.[1] The second and more serious limitation is that restriction of imports, beginning in 1940 and extending in varying degrees to the present time, has kept consumption below what it would have been in the absence of such curtailment of supply.

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[1] The paper consumption of these two countries at the times of their respective separations from India is not known. Nonetheless, in the case of Burma, an approximation can be made, based on Indian paper exports to that country in 1940 and 1941--years when Burma was largely cut off from European supplies but Indian paper was still relatively available. Such an approximation would place Burma's 1937 consumption at between 5,000 and 10,000 tons. In Pakistan, the repression of paper consumption since partition (owing to foreign exchange difficulties and lack of indigenous production) has precluded even an approximation of normal demand for that nation.

Footnote to Fig. 6. These figures are not perfectly comparable over the time span shown since they include the consumption for Burma prior to 1937 and for Pakistan prior to 1947.

Estimates projected to 1955-1956 are those of the Planning Commission in Programmes of Industrial Development 1951-1956, op. cit., p. 174.

Consumption data for paper and paperboard were derived by adding together annual import and production figures and by subtracting from their sum yearly exports since 1937. Prior to the separation of Burma from British India in the latter year, exports were never more than a fraction of 1 per cent of indigenous consumption. Consumption of newsprint is assumed to have been identical with imports of this commodity.

Import and export figures were extracted from the Annual Statement of the Sea-Borne Trade of India, op. cit., for the years in question. Production figures up to 1942-1943 were taken from the Report of the Panel on Paper, op. cit., p. 39. Production totals for the last ten years are those of the Development Wing of the Ministry of Commerce and Industry.

A number of attempts have been made to predict levels of Indian consumption in future years, but all have been handicapped by lack of suitable data on which to base such predictions. The most important estimate of anticipated demand, in view of the use which has been made of it, is the one which has been employed by the Planning Commission and by the Development Wing of the Ministry of Commerce and Industry for scheduling the expansion of domestic production.[1] According to this estimate, the aggregate demand for paper, including paperboard but excluding newsprint, will be 200,000 tons by 1955-1956 when the present Five Year Plan will have expired. The demand for newsprint has been placed at about one-half of that figure, or 100,000 tons, but the Planning Commission has suggested that high prices of imported newsprint may force the country to get along with less than that amount. These Planning Commission predictions were made in 1952, and it now appears that the projection for paper and board will fall short of actual consumption in 1955-1956.

The most recent as well as the most detailed projections of future consumption trends were made by an expert of the Food and Agriculture Organization of the United Nations at the request of the

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[1] Programmes of Industrial Development, op. cit., p. 174. See also the Report of the Panel on Paper, op. cit., p. 11.

Government of India in 1953.[1] These projections are extremely valuable to those concerned with the growth of the industry, even though they were of necessity built on a structure of problematical assumptions. The initial premises of the FAO consumption estimates were these:

(1) That the Indian population would increase at a rate of 1.25 per cent per year;

(2) That the level of literacy in the country, assessed at about 17 per cent in 1951, would double in each of the next two decades;

(3) And that industrial production would rise roughly 10 per cent per year.

Proceeding from these premises, it was conjectured:

(a) That paper consumption would expand proportionately with rising population;

(b) That increased literacy would account for a 200 per cent rise in the demand for writing and printing papers and a 300 per cent rise in the demand for newsprint over the next two decades;

(c) And that growing industrial output would augment the demand for wrapping papers and boards by 5 per cent per year.

The numerical totals derived in this way are shown in Table XIV below:

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[1] These data on demand were made available to the writer through the courtesy of officials of the FAO in Rome in April, 1954.

TABLE XIV

ESTIMATES OF FUTURE DEMAND FOR PAPER AND PAPERBOARD[a]

(IN LONG TONS)

Category of Paper	Av. Cons. 1948-1952	Estimated Consumption 1957	1962	1972
Writing and Printing	95,500	137,000	184,000	378,000
Wrapping and Board	65,000	85,000	107,000	151,000
Total (ex. Newsp.)	160,500	222,000	291,000	529,000
Newsprint	56,500	91,000	130,000	296,000
Total All Paper	216,000	313,000	421,000	825,000

(a) This table is based on demand data initially worked out by Mr. Arne Sundelin in FAO, Report to the Government of India, op. cit., p. 9. Adjustments have been made in the original FAO figures to eliminate consumption of strawboards and millboards. This has been accomplished by (1) subtracting 32,000 tons from the original 97,000 tons total for "wrapping and board" in the base year, and (2) reducing succeeding totals in this same row proportionately. The 32,000 ton figure is a Planning Commission estimate of consumption of strawboards and millboards in 1949-1950 and 1950-1951. Programmes of Industrial Development, op. cit., p. 174.

These projections are not presumed to be more than very general indicators of future trends. Needless to say, they include no allowances for major military or economic crises nor for the effects on demand of large upward or downward price shifts. Of the three basic assumptions, the first and third were arrived at by extending known growth curves, but the second (pertaining to literacy) could have been little more than an intelligent guess, since as late as April 1954, the Ministry of Education of the Central Government was still without a specific program for implementing the literacy objectives of the Five Year Plan.

As a check on the validity of the foregoing estimates, one further projection of future demand was made by the FAO representative, using a method which had previously been found effective in a study of Latin America's paper making prospects. This method is based on the observed existence of a high correlation in the countries of the free world between per capita demand for paper and per capita income. If per capita consumption is plotted against per capita income for a large number of these countries, a scatter diagram will result to which a regression line can readily be fitted. From such a regression line it is possible to predict future demand for paper based on estimates of anticipated increases in income.[1]

On the basis of projections in the Five Year Plan, per capita income can be expected to double at the end of twenty-five years. If income does increase at this rate and if the income-consumption correlation described above remains valid, then demand for paper in India will increase from about 1.5 pounds per person in 1952-1953 to approximately six pounds per individual in 1972. This latter figure is 40 per cent higher than the 4.4 pounds of total paper, paperboard, and newsprint consumption per person indicated for 1972 in the first

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[1] For a more complete explanation of this method see United Nations, Department of Economic Affairs, Possibilities for the Development of the Pulp and Paper Industry in Latin America, New York: 1954, pp. 129-130.

FAO estimates.[1] It seems reasonable, therefore, to assume that future demand will be at least as great as (and probably greater than) is indicated in Table XIV. This means that if India is to satisfy most of her paper requirements from indigenous production, a fourfold expansion of the domestic industry will have to take place over the next twenty years.

The potential demand for paper which will face Indian manufacturers in the future will not be limited to the domestic market, however. There is a rapidly growing consumption of this commodity in most of the countries of South Asia and the Far East. At an FAO conference in 1953 it was estimated that the gap between the production and the requirements of this part of the world would exceed 700 thousand tons in 1960-1962.[2] The most logical external markets for Indian made paper are in Burma, Ceylon, and Pakistan, with other potential customers in Malaya, Indonesia, and Indochina. The traditional barrier to exports in the past has been the low quality of Indian paper relative to its price. In more recent years, the inability of the domestic industry to meet the country's needs has precluded serious consideration of large scale exports. Other obstacles to sales in neighboring nations have been political animosities and foreign exchange difficulties. At the present time all of these barriers to export still exist, although it seems very possible that the last two may diminish in the near future.

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[1] United States per capita consumption of all types of paper and paperboard in 1953 was 391 pounds, including 75.5 pounds of newsprint. Letter from John H. Vogel, Economist, American Paper and Pulp Association, New York, October 28, 1954.

[2] FAO, "Preliminary Summary of the World's Pulp and Paper Resources and Prospects," unpublished report dated 22 September, 1953, p. 30.

External demand for Indian made paper will inevitably be determined to a very large extent by the price of this paper relative to world prices for paper of equivalent quality. Needless to say, an upward shift in international paper prices would enhance India's export opportunities, even as a worldwide price decline would damage them. However, apart from unpredictable international price trends, it does appear from evidence cited above that there will be a substantial and growing demand for paper over the next decade in countries of South and Southeast Asia. The opportunities inherent in this growth of regional paper consumption are ones that the Indian paper makers would do well not to overlook.

At the present time, current imports are more significant to the Indian paper makers than are future exports. Although protected domestic production is now about four times as large by volume as the total of imports (exclusive of newsprint) there is still a considerable margin for displacement of the latter by the former. It would probably be uneconomical for Indian mills to attempt to manufacture the high grade, specialty papers which are now imported in small quantities from abroad. However, present imports are not by any means confined to these varieties. Examination of trade statistics shows that average imports from March, 1950 through September, 1953 included 14,000 tons of printing and writing papers (exclusive of newsprint), 18,500 tons of wrapping papers, and 4,000 tons of boards, for a total of 36,500 tons per year, valued at Rs. 65 million. Average annual imports of newsprint over the same period amounted to 61,500 tons valued at Rs. 53 million.[1] It will be noted that although the quantity of newsprint purchased from abroad exceeded that of all other papers by almost 70 per cent, the payments for newsprint accounted for less of a drain on the country's foreign exchange balances than did those for the more expensive papers made from chemical pulps. India's requirements of newsprint cannot be met by indigenous production for many years to come, but its demand for the good grades of commercial and cultural papers which must now be imported stands as a challenge and an opportunity to domestic mills.

The assumptions generally held by Indian paper makers with respect to the elasticity of demand for their products were discussed in Chapter 6. It will be recalled that their premise of relative price inelasticity was not shared by the Planning Commission. A recent study by UNESCO experts of paper consumption in many countries suggests that in lesser developed economies the demand for cultural papers may be relatively elastic with respect to changes in both price and income levels. In an analysis of the demand for printing and writing papers the UNESCO representatives observed that in advanced countries this demand rises and falls more slowly than real incomes and is not highly sensitive to small changes in price. In underdeveloped regions, on the other hand, the consumption of cultural papers rises faster than the standard of living and is more sensitive to falling paper prices than it is in industrially developed countries. The UNESCO study goes on to point out that:

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[1] Annual Statement of the Sea-Borne Trade of India, op. cit., 1950 to 1953. For a summary of annual imports broken down into major categories from 1923-1924 to 1952-1953 see Appendix II B, infra.

> As yet, books and writing paper belong in the category of luxuries in underdeveloped countries; but once their prices have been brought within the income range of only a small section of the working population, the resultant increase in demand will be disproportionately heavy.[1]

These findings suggest that in India, where cultural papers comprise almost 60 per cent of production, reductions in domestic paper prices would stimulate a marked increase in consumption.

The over-all demand situation facing the domestic paper industry is distinctly a favorable one. Present indications point to a rapidly growing consumption of all of the major varieties of paper for the next two or three decades and probably well beyond them. If the industry merely waits for increasing literacy and expanded incomes to extend its markets, it can anticipate by 1972 four times the demand that it enjoys today. If it takes active steps to stimulate local consumption and to seek out foreign markets, it should be able to enlarge the demand for its products to an even greater extent.

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[1] UNESCO, Paper for Printing, op. cit., pp. 57-58.

If it may be assumed that Indian paper consumption in future years will be at least as large as is indicated in Table XIV, the question of whether indigenous supply can be expanded to meet this growing demand becomes a highly significant one. Since it is technologically possible to produce marketable paper from a wide variety of vegetable fibers, many of which are to be found (or could be grown) in India, the problem of raw material supply is not essentially a technical one. Rather it is economic in nature and involves the question of what prices the industry can afford to pay for its materials. Raw material rates depend on the prices which the paper makers can get for their finished products, while, as was seen in Chapters 4 and 6, the price of finished paper is in turn dependent on the costs of raw materials. It is not necessary to elaborate further on the circular interdependence of costs and of prices to make the point that, in the discussion which follows, there are inherent assumptions of cost limitations in the concept of availability of resources.

It will be recalled from earlier pages that India's most important paper making raw material is bamboo, the potential yield of which is estimated at more than one million tons per year from existing forests. This yield can undoubtedly be augmented considerably by substantial investments in silviculture and forestry research. At the present time such investments appear to be beyond the budget limits of a majority of the states as well as of most paper firms. Nonetheless, it should be possible through the combined efforts of certain state governments and of any one of the larger paper producers to begin even now to expand the nation's accessible bamboo resources.[1] As in the case of bamboo, the yield of India's secondary paper making fiber, sabai grass, can be increased from present levels by more extensive cultivation. This latter possibility may have considerable significance to the paper industry if current experiments show that the grass can be grown economically on wastelands. The practicality of growing sabai as an agricultural crop may depend on whether a mechanical cutter capable of harvesting the grass at low cost can be developed.

It is impossible to predict with any degree of confidence what will happen to the prices of these raw materials as demand for them increases. On the one hand, increasing scarcity of readily available bamboo and grass will lead to the opening up of sources more distant from existing mills, roads, and rail lines, with consequent increases in transport costs. On the other hand, strategic placement of new paper mills, extensions and improvements of the present transportation network, and increased yields (as a result of better forest management) from areas close to already established mills will tend to reduce freight charges. Appreciable savings may also be realized through: (1) better planning of operations; (2) better storage of materials with consequent reduction of losses from spoilage and pilferage; (3) the introduction of a few appropriate pieces of mechanical equipment; and (4) more effective employment of the equipment (mostly consisting of trucks) already in use. It is probable that extraction operations will have to be carried out on a somewhat larger scale than has normally been the case if mechanical equipment is to be most effectively utilized.[1]

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[1] An important supplementary source of bamboo is to be found in the rich and hitherto unexploited forests of neighboring Burma. Although the Burmese Government has indicated its intention of developing a paper mill of its own, it will still have a surplus of this fibrous material which should be exportable, providing transport costs are kept down.

In addition to bamboo and grass there are several other fibrous materials whose latent importance to the paper industry is believed to be great but whose present utilization is extremely limited. The most notable of these are bagasse and Himalayan firs, but hardwoods such as salai, maharukh, paper mulberry, and eucalyptus may also achieve significance in paper making operations of the future. In the case of bagasse, there are still some technical problems which require further study before it can be considered an entirely satisfactory material. These are of lesser importance, however, than the high costs of handling and of transportation which are associated with its use. There are a few locations in India today where it is believed

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1. Among the pieces of equipment which might find economic use are: light tractors for silviculture; portable chippers for reducing the bulk of bamboo before shipping it from the forests; trailers for increasing the hauling capacity of existing trucks; and simple conveyors to speed up loading and unloading operations and thus to reduce the idle time of trucks and freight cars.

that bagasse paper mills can profitably be erected and operated. Experience with mills thus situated should indicate how much further use can be made of this raw material, whose potential supply exceeds 3 million tons per year.

Economic factors also impede the use of the wood fibers mentioned above. Extensive afforestation with hardwoods is held back by the relatively high costs of such operations, while the exploitation of Himalayan conifers is hindered by the currently prohibitive expense of hauling the wood from mountains to mills. Until such hauling costs can be sharply reduced, it is unlikely that India will be able to expand her newsprint production beyond the confines of the Nepa Mills. There is little doubt that roads will ultimately be extended into the mountainous areas but prospects for such extensions within the next ten years are not very bright.

Other fibrous inputs of appreciable importance to the paper makers are rags and waste paper. Rising standards of living will increase the available quantities of both of these materials and may consequently reduce the costs of collecting them. The relative importance of rags will probably decline in the future while that of waste paper should increase as the industry expands. With respect to all of these materials it is always necessary to remember that their supply situation is relative to the price which the industry can afford to pay for them. An upward shift in paper prices, for example, could alter the present supply picture appreciably by opening up sources of materials which were hitherto unprofitable to exploit.

Problems associated with the supply of secondary paper making materials, and especially of chemicals, are of a somewhat different nature from those relating to primary materials. Most of these secondary materials are now produced domestically, but for reasons discussed in Chapter 3 (the most notable of which are high protective duties and the uneconomic scale of production units), their prices are extremely high by Western standards. Increasing demands for these chemicals should bring about gradual price reductions, but it is doubtful if chemical production in India will emerge from the infant industry stage for many years to come.

A further physical resource problem which will face an expanding paper industry will be that of water supply. Mill sites which combine ready access to raw materials and fuel with an adequate source of fresh water appear to be fairly scarce. Insufficient attention to water supply problems in the past has held back the growth of several domestic mills. The number of possible paper mill locations favorably situated with respect to physical resources should increase with the expansion of government sponsored hydroelectric projects. Growth of these projects will serve to reduce the power costs of companies situated within range of them but most paper manufacturers will continue to depend on coal for their power needs. The cost and availability of coal to the mills will continue to be heavily dependent on the status of railway transport.

Transportation charges which constitute a large proportion of the cost of almost all paper industry inputs will probably be reduced in the future, at least on some commodities and for some mills. Such reductions will be accomplished by the shortening of haulage distances rather than to the cutting of freight rates. Because of the indirectness of routes over which materials must travel in India, freight costs are often much greater than map distances would indicate.[1] Decreases in haulage miles will be brought about in the future through extensions and improvements in the nation's rail and road systems, and through the construction of more bridges and other cross linkages between existing elements in the present transportation network. Because of the heavy investment inherent in such construction, progress in this direction is bound to be slow.

At the present time the railways are operating at full capacity and are struggling with critical shortages of freight cars and other equipment. They are barely able to meet the demands currently imposed on them and would certainly not be able to sustain the increased load that would accompany a total rate of industrial growth much more rapid than the present one. The Government has recognized the necessity of improved transportation in its development programs and has allocated more than 21 per cent of its budgeted outlay under the Five Year Plan for this purpose.[1] Despite this large allocation of resources, it is unlikely that expansion of facilities for the movement of passengers and goods will be able to keep pace with growing demands for such services. The experience of the paper industry with recurring delays, shortages, and bottlenecks in transportation points up the critical importance to industrial development of adequate and timely investment in transport facilities.

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[1] The most dramatic example of a roundabout transport route is the rail link between West Bengal and Assam which was made necessary by the partition of 1947. The high cost of hauling freight over this lengthy route has obstructed the utilization of the rich bamboo resources of Assam and will continue to do so until the Government of Pakistan devaluates its inflated currency and comes to an agreement with the Government of India on allowing shipments across its territory.

As was observed in Chapter 2, the paper industry must turn to Europe and to America for almost all of its requirements of machinery and equipment. This fact encourages the more forward-looking companies to take advantage of new developments in Western paper technology and permits them to shop around for bargains among the paper machinery manufacturers of the free world. In other respects, however, dependence on imported equipment works to the disadvantage of the Indian mills. In the first place, equipment costs are 15 to 25 per cent higher in India than in the country of origin owing to shipping and handling costs and to a 10.5 per cent import duty.[2] In the second place, most foreign-made equipment was planned and constructed for use under contrasting climatic conditions, and with dissimilar raw materials, differing grades of chemicals, and more highly trained workers than are to be found in India. In consequence, this equipment often gives unexpected difficulties and generally operates at lower efficiency than it would in its native land.

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[1] The First Five Year Plan - A Summary, op. cit., pp. 101-103.

[2] Indian Customs Tariff, op. cit. p. 38.

Additional problems arise from the fact that many imported units have designed into them automatic devices and mechanical conveyors which are economically justified only in countries where labor costs are much higher than they are in India. However, while the inappropriateness of labor-saving devices in an overpopulated economy must be taken into account, it should also be remembered that automatic equipment has other, and often more important, functions including those of enhancing quality, improving yields, and increasing operating efficiency. For these reasons it is unrealistic to generalize broadly on the wisdom or the folly of employing capital intensive, self-regulating, and highly mechanized pulp and paper making equipment in a country like India. Some units are necessary and appropriate regardless of the cost of labor, whereas other elements could profitably be replaced by more labor intensive methods in situations where manpower is cheap. What are needed are careful cost and efficiency studies to determine what combinations and variations of equipment are likely to be most suitable to Indian conditions.[1]

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1. Other handicaps associated with using machinery and apparatus made in distant countries include the curtailment of manufacturers' services and the extension of delivery times with concomitant tying up of temporarily unproductive capital.

According to figures cited in Chapter 4, the amount of new capital investment in buildings and machinery which is required to produce an additional unit of output varies widely between paper making units. Owing to the broad range of conditions under which mill capacity may grow, precise costs of incremental output cannot be given. A rule of thumb figure for new mill investment would be approximately Rs. 2,000 per annual ton of production. The cost of expanding existing units averaged about one-half of that amount.[1] As was also explained earlier, paper mill growth entails heavy lump sum expenditures at particular stages to pay for bulky and expensive pieces of equipment. What is more, efficient operation under present day conditions requires relatively large-scale production and proportionately large investment. The introduction of Japanese paper making equipment, which is appreciably cheaper than its Western equivalent (see footnote at the end of Chapter 2), may alleviate this problem in the future, but the performance of this equipment under Indian conditions has yet to be demonstrated. Meanwhile the quantity of capital needed for expansion by many of the smaller paper companies continues to exceed the amounts which they are able to raise from their own resources or from private financial institutions. The banking system is of little help to them since most banks are unwilling to engage in long term financing and are relatively conservative in their lending policies.

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[1] These approximations are based on: (a) Planning Commission data for capital expenditures on new or expanded mill facilities, (b) estimates by company officials of the current cost of increasing capacity, and (c) balance sheet entries for fixed investment in the Ballarpur and Nepa Mills.

In contrast to the small firms, the four or five leading paper manufacturers with long standing records of good earnings appear to have little difficulty in financing new investment either from reserves or by use of the share markets. The public seems ready to invest where it feels assured of the soundness and of the earning power of the company. It is far less ready to advance funds to new ventures or to companies which are small, or relatively unknown. Although a detailed discussion of Indian investment finance cannot be undertaken here, several factors may be noted which help to explain the so-called "shyness" of native capital.

The first of these is the apparent decline in recent years of the amount of wealth available for investment. This decline is attributable to high taxes, to the decimation of the fortunes of the nabobs and the maharajahs, and to the repatriation of much British capital since Indian independence. Although insurance companies, provident funds, and other institutional investors have partially replaced the wealthy individuals of former years as sources of private finance, they have not been able, as explained below, to provide the share markets with the risk capital that has been needed.

Two other significant and interrelated factors are the relatively unregulated nature of the share markets and the unavailability to the average investor of adequate means of checking on the soundness of security offers. Despite the fact that much indigenous business enterprise has a rather dubious public reputation, prospective buyers of securities are offered only the most fragmentary data with which to evaluate potential investments. The traditional secrecy of Indian and British-Indian companies combined with the absence of laws requiring disclosure of significant information leave the perplexed investor in the position where follow-the-leader seems to be the safest course. Since the most prominent lenders are often the insurance companies which are legally limited to purchasing only the safest types of securities, private investment capital has tended to behave even more conservatively than market conditions would warrant.

Some compensation for shortages of private capital has been provided to a number of industrial firms by state and Central Government programs of assistance. As has already been remarked in the cases of the Nepa, Ballarpur, Sirpur, and Mysore paper mills, state governments have made large contributions toward mill underwriting by purchasing shares and by granting long term loans on generous conditions. Such instances of financial aid have been specific to particular projects which the states wished to encourage.

A more general and enduring program for assisting private enterprise was initiated in 1948 by the Central Government with the creation of the Industrial Finance Corporation. This government sponsored corporation, designed to operate according to business principles, was established to provide medium and long term credit to industrial enterprises. Since its inception the I.F.C. has followed relatively conservative loan policies which are said to have eased the long range finance problems of a number of industries but which have not alleviated shortages of venture capital. Up to the end of 1953, the I.F.C. had made possible a major expansion of the Mysore Paper Mills through a five million rupee loan and had approved a loan (subsequently declined by the company) for increasing the size of the Star Paper Mills.[1]

The shortage of equity capital, mentioned above, which has hobbled industrial growth in recent years, should be partially alleviated in the near future by the operations of the newly created Industrial Credit and Investment Corporation of India. Although this part-government part-private corporation will not be able by itself to supply the industrial sector with more than a modest share of the investment capital that the latter will need, its contribution to the pool of equity finance should be a significant one. In addition the I.C.I.C.I. may, by its example give private investors the leadership and the confidence which they have so sorely lacked since the end of World War II.

The human resources available to Indian industry have almost always been quantitatively superabundant, and industrial labor has not been wanting in intelligence, dexterity, or the capacity to learn, but the skills, energies, and talents of individual workers have tended to be inadequately developed and incompetently utilized. Among

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1. Between 1949 and 1952 the I.F.C. made industrial loans totalling 140 million rupees. Of this amount, 7.4 million rupees, or slightly more than 5 per cent was allocated to the paper industry. For a good, short account of the I.F.C., see _Investment in India, op. cit._, pp. 64-65.

the barriers to the more effective use of labor resources have been the familiar problems of poverty, ill health, illiteracy, and lack of facilities for technical training. Marked progress towards the diminution of these barriers within a generation can be expected in response to the Government's broad programs of education, public health, and economic development. Although temporary frictions and dislocations will probably continue to accompany improvements in the status of workers, the over-all trend is in the direction of a healthier, more alert, and more competent labor force.

As the quality of the labor force is raised, the supply of potential supervisors is thereby augmented and the possibilities of promotion from worker ranks to supervisory status are greatly enhanced. Such increases in vertical mobility within the industrial structure are greatly to be desired in paper mills as well as in other types of production units. Improvements in the quality of mill supervision can be anticipated not only from this quarter but also from the country's overflowing reservoirs of college graduates. With increasing proportions of these graduates indicating an active interest in industrial careers, it seems likely that the quality of future supervisors drawn from this source will be lifted above present levels.

It will be recalled that the paper industry is not dependent on indigenous personnel exclusively to fill managerial posts at the mill level. Several dozen foreign technicians now occupy key production and engineering jobs and as many more fill positions of lesser importance. The former group represents a human resource of great value to the industry at the present time and one whose services can be dispensed with only gradually (and probably not entirely) during the next twenty years. Although pressures to replace Westerners with qualified Indians will probably increase in the future, it seems unlikely that Indianization will be carried to its ultimate stage before it has been demonstrated that Indian nationals can take over all technical jobs without significant lessening of productive efficiency.

Development to their fullest capacity of the human resources available to Indian industry is repressed by at least two factors other than those noted above. These factors are adverse climatic conditions and a cultural environment which is not highly conducive to industrial efficiency. The debilitating effects of approximately three months of searingly hot weather each year followed by at least three months of steaming monsoons are reflected not only in the decreased efficiency of labor and supervision but also in the very tempo of Indian life. Less is attempted and less is accomplished within a given time period than is generally the case in countries with more temperate climates.

As enervating to the ambition and efficiency of many industrial employees as the tropical heat are certain widely held beliefs, ideologies and customs. These tenets and practices are often meretorious, justifiable, or at least understandable in themselves, but they tend to run counter to the needs and to the rationale of industrial operations. Among them may be included: the other-wordly emphasis of the Hindu religion; the Gandhian glorification of primitive methods; the strong attachment of workers to their natal villages and to the soil; the generally low prestige accorded to business occupations; the traditional social and occupational rigidities in rural Indian life; and the inability to believe that a man can be the master of his own destiny. Although there is no way of measuring the effect on industrial performance of these ideological and social influences, it is apparent that at the present time they stand as significant psychological deterrents to a more complete realization of human capabilities in an industry such as paper making. On the other hand it is well to remember that important changes are now being made in the social and cultural climate of the country and that these changes may be expected to diminish existing psychological restraints to effective performance.

In summary, the conclusions which emerge from this appraisal of the growth resources of the Indian pulp and paper industry are these. Sufficient quantities of fibrous materials are now in existence, or can be made available without excessive cost, to meet probable demands for all types of paper except newsprint over the next quarter of a century. Indigenous raw materials for making newsprint will probably not be obtainable in adequate supply until the Government undertakes the heavy investment necessary to extend transport lines into the timber-rich Himalayan regions. Scarcities of cheap fuel and of year-around water supplies will continue to pose problems in certain regions but these are not believed to be insurmountable. Chemical costs will remain high but their adverse effects may be ameliorated by more efficient use of chemicals in pulping operations. Improvements in the nation's transportation system will come about gradually and will bring benefits in terms of lowered costs to particular areas and on particular commodities.

The Indian paper industry, as contrasted with its Western counterparts, will continue to suffer a moderate disadvantage in the acquisition and employment of paper making equipment. It will have access to the best equipment that Western and Japanese technology can produce but this equipment is likely to be imperfectly adaptable to its needs. The high price of pulp and paper making machinery combined with a relative scarcity of venture capital may discourage the establishment of new concerns and will surely handicap the growth of the small mills now in existence. Capital shortages should not be a serious deterrent to the growth of already prosperous paper concerns and will be less of an obstacle to smaller units if financial assistance continues to be forthcoming from the state and central governments.

The quality of human resources can be expected to improve from year to year as a by-product of advances in the standard of living and as a result of progress in the fields of public health and education. The question of how effectively these human and other resources can be utilized in the paper industry is the subject of the following chapter.

CHAPTER 11

Industrial Performance and Prospects

In the last chapter it was shown that a rapidly growing demand for paper can be expected in India and in neighboring countries for many years to come. It was also shown that raw materials and other resources will, for the most part, be adequate to permit the Indian industry to meet this anticipated increase in consumption. Except in the case of newsprint, it is believed that where inadequacies and shortages exist, they can be overcome by intelligent and energetic efforts by mill managements, supplemented by limited assistance from the Government. Somewhat similar conclusions may be drawn with respect to most of the other problems associated with the future growth of paper making in India. Whether or not this industry develops to its full potential over the next few decades will depend to a considerable degree on the foresight, ingenuity and energy displayed by its managerial and technical personnel as well as on the steps taken by the Government to provide an economic and a political environment favorable to vigorous and healthy industrial expansion. It will depend also on two other critically important variables, namely the rate and the direction of cultural and social change in the country during the same period. The relationship of cultural change to industrial progress cannot be adequately explored here, but the need for certain mutations in environmental and attitudinal factors will be indicated in this chapter on the performance and prospects of the paper industry.

Viewed from an over-all perspective, this industry is seen to be making steady, if not spectacular, growth and to be moving in the direction of greater operating efficiency and a more economic use of resources. Current trends are towards larger scale operations, more complete utilization of technological developments, and exploitation of locational advantages. Leadership has largely shifted from foreign to domestically managed organizations, and the long time dominance of the industry by a single concern has ceased. Within the past five years or so, Indian paper making has begun to feel the impact of new ideas and of more dynamic operating concepts. Most of these ideas have come from foreign technicians and consultants and from Indians who have studied abroad, but some innovations have also sprung from purely indigenous sources. In respect to mill operation there are signs of increasing ingenuity in eliciting greater output from existing facilities. In the fields of organization and finance, there are evidences of undeniable entrepreneurial talent.

Despite these favorable aspects, it is apparent that the industry is still falling short of what might be considered satisfactory performance by international standards. Resources continue to be inefficiently used, personnel remains poorly trained and inadequately motivated, and the possibilities inherent in rationalized production are only beginning to be explored. The paper manufacturers as a whole have shown little creativeness in adapting foreign technology to Indian conditions and have indicated little interest in attacking their problems through investments in engineering and research. Not only in past and present performance but also in certain attitudinal factors there are seen to be obstacles to progressive growth. These obstacles and the prospects for overcoming them are considered in the following pages.

It will be recalled from earlier chapters that in the realm of production there are relatively wide variations in the characteristics and performances of India's twenty paper mills. Perhaps the most significant of these is the variation in the scale of operations, as illustrated by capacities ranging from 1,000 to 31,000 tons per year (see Table I, Chapter 1). Although the optimum size of an integrated production unit undoubtedly varies in accordance with local conditions and type of product, it seems evident that for most Indian mills this optimum figure will not be less than an annual capacity of around 15,000 tons. In situations where all necessary inputs are available in sufficient quantities, the most economical scale of integrated production will probably entail at least twice that output.[1] Such comparatively large-scale production is exacted by technological indivisibilities (notably those of the Tomlinson chemical and heat recovery furnace), by declining capital costs per unit of output with increasing size of equipment, and by the need for a level of production capable of supporting expanded overhead expenses. Although there were only three mills by mid-1953 whose operating capacities exceeded 15,000 tons per year, the number of such units was expected to have increased to eight (accounting for more than 75 per cent of total output) by the end of 1954.[1] In addition, one or more of the remaining paper firms had definite plans for expanding into this size category within the next few years. This pattern of growth is evidence of an increasing awareness on the part of the leading paper manufacturers of the current profitability, and perhaps of the ultimate necessity, of relatively large-scale operations.

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[1] These statements apply to firms making medium grade printing, writing, and wrapping papers and boards (i.e., to most of the Indian industry). They do not apply to specialty mills like

Not all paper producers believe it to be either wise or necessary to build or to expand mills to the size levels specified above. Some feel that the "minimum economic unit" of 8,000 tons capacity specified by the Panel on Paper, Pulp and Board in 1947[2] is sufficiently large. Others point to good profits at considerably lower

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Tribeni Tissues Limited nor to units like the Pudumjee Mills which merely reprocess waste paper to make low grade wrappers.

[1] Included among these eight units is the Bengal Paper Mill whose annual capacity will actually be slightly less than 15,000 tons.

[2] Report of the Panel on Paper, op. cit., p. 28.

levels of production and appear content to continue operations at approximately these levels. There appears to be some confusion as to what constitutes an economic unit, not only among the managements of the smaller firms, but also in other areas of the paper industry, as well as in certain government quarters. The standard of measurement, naturally enough, is not the Robinsonian one of technical, managerial, financial, and marketing optima referred to in Chapter 5, nor is it the minimum mill that could hold its own in an unprotected market. Rather, it appears to be the smallest size of operation from which a reasonable return can be earned under present day conditions. Such a standard may be a perfectly sound one for short-run business calculations but it is somewhat less than adequate for long range industrial planning. It assumes the continuation of shortages of good quality paper and the extension of import quotas, of high tariff rates, and of other government subsidies. Calculations made on such assumptions are almost bound to lead to the perpetuation of inefficient units and to a continuing need on the part of the industry for a shield from the rigors of competition.

Although it is believed by the writer that most Indian mills must grow to at least the 15,000 ton size if the industry is ever to meet external competition on a relatively equal footing, it cannot be stated categorically that all units must do so. A few smaller units may always be able to operate at a profit in competition with larger organizations either because of particular locational advantages or as the result of adjusting their production to specialized market demands. In addition there is the possibility that a large-scale pulp mill might be erected to produce cheap indigenous pulp from bamboo or bagasse.[1] In such an event, there would be a place in the industry for small, flexible, unintegrated, paper making organizations designed to cater to small orders and to particular customer needs. However, since it is unlikely that a pulp unit of this sort will be established in the foreseeable future, opportunities for successful, small-scale operations appear to be growing more and more limited.

An important determinant of the rate and the direction of growth of this industry has always been the ability of its paper makers to adapt Western technology to Indian raw materials. This was true at the close of the last century when the soda process was utilized for pulping native grasses. It was true also in the 1930's when the sulfate process was first employed on an industrial scale with bamboo. It remains valid today, as the more progressive mills import new and complex chemical recovery facilities, high speed machines, and other innovations hitherto unseen in indigenous mills. There is a need, first of all, to increase the effectiveness of equipment and of techniques already transplanted from abroad. There is a further need to make the fullest use of recent developments in other countries which might be adapted to the utilization of India's resources of tropical hardwoods and bagasse. Solutions to problems in the first category can yield substantial and fairly immediate benefits to the paper industry, but there is still a widespread reluctance to undertake the research effort necessary to arriving at such solutions.

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[1] The pulp from such a mill would probably be utilized for the indigenous manufacture of rayon and cellophane as well as for making paper.

The primary reason for the lack of effective and continuing research by the paper manufacturers has probably been the high cost of such activity relative to the levels of output of most firms. Other causes have been the failure of company officials to recognize the benefits to be derived from expanded efforts in this area, and the weakness of competitive stimuli. The smaller firms have not been able to afford research departments and the larger units have managed to get along quite comfortably without them. Mill managements have complained, with some justification, that the work being done by the paper technologists at the Forest Research Institute has been of little practical use to them. They have not felt it necessary, however, to compensate for shortcomings at Dehra Dun by engaging in research programs of their own. What is badly needed is a substantial investment in applied research aimed primarily at improving the quality, raising the yield, and reducing the cost of bamboo pulp. Such an investment will become increasingly feasible, either on a cooperative basis or by individual companies, as expanded scales of operations multiply revenues and make possible greater degrees of specialization. The economic obstacles to industrial research are diminishing but certain psychological barriers remain. Despite the urgings of their technical staffs many mill managers and managing directors remain unconvinced that the results of research justify its cost. In addition they cling to a traditional attitude of secrecy with respect to their operations and are hesitant to share their knowledge with other firms. Whether these attitudes will change in the next few years cannot be predicted. In the absence of effective competition to goad managements into innovation and risk-taking , the outlook for dynamic research activity in the near future appears fairly dim.

Another phase of mill operation in which careful study and analysis would be of value is that of materials handling. In lifting, conveying, storing, loading, and unloading raw materials, fuels, and finished products, paper companies employ a wide range of methods from the most primitive and labor intensive to the most elaborate and capital intensive. Some of these methods are appropriate to the demands of the job and consistent with the relative prices of labor and capital but many of them are not. As observed in the preceding chapter, it is believed that impressive increases in efficiency and decreases in costs could be realized through studies designed to determine which methods and which equipment are most suitable to conditions in India. This is an aspect of the productive process to which little critical attention has been paid. It has been too easy either to accept Western techniques without qualification or to follow old and familiar procedures without question.

It is not only in the choice of methods and technology but also in their use and application that Indian paper manufacturers have given evidence of certain shortcomings. There are, of course, broad variations between the productive efficiencies of mills within every paper making country, and, as has been seen, India is no exception to this rule. Nonetheless, certain patterns of performance do appear to characterize the majority of Indian mills. Most notable among these is a tendency to neglect equipment maintenance, with an inevitable accompaniment of broken down machinery and lost production time. Of comparable importance are a lack of intense interest in achieving optimum performance from available facilities, and a seeming unawareness of the cumulative significance of a host of minor losses and inefficiencies. Supervision in many companies appears singularly unappreciative of the savings in fuel, water, chemical, and raw material costs potentially available through tighter operations of plants and machinery. The absence of a vital concern for high standards of maintenance and of performance results in incomplete utilization of equipment and in unproductive consumption of resources. In a country where capital is relatively scarce and material costs are often excessive, neglect of equipment and dissipation of even a small percentage of resources is an expensive luxury which can ill be afforded.

Deficiencies in productive performance of the type mentioned above are symptoms of shortcomings in the quality, training, and utilization of personnel. Some of the limitations which present environmental conditions impose on the capabilities of workers and supervisors were mentioned in the preceding chapter where it was also indicated that a gradual upgrading in the quality of human resources is to be expected. The problem facing the paper manufacturers is how to achieve maximum effectiveness with human resources which are less than ideally suited to their needs.

In attempting to develop an industrial work force from the surplus of an agricultural population, the majority of paper companies have been moderately successful. Their approach has been the paternalistic one of providing on mill compounds, housing, utilities, and various community benefits, so as to make living conditions for their employees reasonably satisfying, and often better than what they had previously known. With encouragement and help from the Government, the companies have made substantial contributions towards raising the standards of living and improving the health, nutrition, and education of workers and their families.[1] In so doing, they have managed to develop relatively stable and comparatively contented labor forces, but they have not yet overcome problems of chronic and seasonal absenteeism.

Within the mills, the companies have played down the divisive influences of caste and religion and have tended more and more to select and to promote employees on the basis of ability. In response to union pressures, they have begun to systematize wage structures and to standardize hiring and disciplinary procedures. Although there has been a rapid growth in the extent and the influence of labor organizations among paper mill workers since 1945, union-management relations have been relatively peaceful and constructive outside of the State of West Bengal. Within that state, a combination of radical labor leadership, of inadequate and overcrowded living conditions for workers, and of inflexible managerial attitudes, has spawned a series of strikes and other disturbances since the end of World War II. Despite these examples of the failure of peaceful negotiations, it is believed that industrial relations in the paper industry are gradually maturing and are becoming established on increasingly sound foundations.

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[1] Excepted from the above generalizations are older units situated in the environs of Calcutta and the half-dozen smallest and poorest mills in the industry.

As a rule, the paper makers have placed considerably more emphasis on the provision of worker benefits than on the improvement of worker performance through the use of accepted techniques and methods of personnel administration. Only a bare beginning has been made by most firms in this latter field although there is good reason to believe that substantial increases in employee efficiency would result from the wider utilization of enlightened personnel procedures. To raise worker productivity (other than through the use of better equipment) most paper companies need to provide more effective on-the-job training and more appropriate incentive systems. Training programs have tended to be given more lip service than attention, while, with two or three notable exceptions, incentive schemes have provided so little visible connection between effort and reward that their motivating power has not been very great.

The effective use of labor resources probably depends as much on the quality of mill supervision as on any other single factor. With technical and managerial abilities among indigenous supervisors still in very short supply, the need for developing an alert, well trained, and responsible supervisory force has come to be increasingly evident. This need will become more critical as foreign technicians are displaced from positions of authority by Indian nationals in accordance with the Government's program of Indianizing industry. In recent years the leading companies have begun to pay more attention to this problem and to try to select and develop talented younger men who will ultimately be qualified to assume key positions in the mills. They have been abetted in this activity by government grants which have enabled a number of these young technologists to go abroad for advanced training in foreign mills and institutions.

While preparing indigenous personnel for positions of top responsibility in the future, all of the larger firms are still dependent, to a greater or lesser extent, on the services of their foreign paper makers and engineers. The most progressive Indian-managed concerns have achieved optimum results in the use of this relatively costly human resource by retaining only a few well qualified foreigners and by assigning to them extensive responsibility for mill operations. By contrast, British-managed firms still employ what, from an economic point of view, appear to be an excessive number of British subjects in their plants. At the opposite extreme are the small Indian mills which employ no foreigners at all but which pay for this lack of experienced guidance through the high cost of inefficient operations.

Although appreciable advances have been made in raising the quality of indigenous supervision, much more will have to be done in this field before this group will be capable of assuming full responsibility for all operations. What is needed in particular is an improvement in the caliber of candidates for managerial positions. This can be accomplished partly by more effective recruitment and selection. It will also require the raising of salary levels, the improvement of training methods, and the augmenting of opportunities and satisfactions available to trainees and junior supervisors.

The development of an adequate number of experienced and technically qualified supervisors is essential to the progressive growth of paper manufacturing. Of comparable importance is the need for evolving supervisory and managerial attitudes which are conducive to industrial efficiency and vitality. The question of attitudes is nebulous, controversial, and almost impossible to discuss without introducing subjective judgments and cultural values. Nonetheless, it is one that cannot be entirely avoided since in industrial situations it is in their attitudes perhaps more than in anything else that Indians differ from Westerners. These differences tend to diminish in response to training and to common experience over extended periods of time, but while they persist they engender substantial disparities in behavior and performance. Several of these disparities will be mentioned here, although it is realized that they are more relative than absolute, that they are open to many exceptions, and that they are not objectively provable. With these caveats and the acknowledgement that industrial supervision in Western countries falls far short of perfection, the following observations are ventured. Among the principal psychological restraints to outstanding performance by Indian supervisory and managerial personnel are these:

(1) An inadequacy of individual self-confidence which discourages the assumption of responsibility and the willingness to make difficult decisions.

(2) A failure to appreciate sufficiently the importance of thoroughness, of accuracy, and of the necessity for maintaining uncompromisingly high standards of quality and of performance.

(3) An excessive harboring of suspicion and jealousy which hampers activities requiring teamwork and cooperation.

(4) An overly theoretical approach and a deficiency of practical ingenuity in dealing with manufacturing problems.

(5) A tendency to lack the drive and perseverance necessary to success under keenly competitive conditions.

If these psychological restraints exist at the present time, as the writer believes they do, it is not contended either that they are unchangeable or that they stand as absolute barriers to the growth of the paper industry. It is believed that the industry will continue to grow in response to increased demand in the protected domestic market regardless of such intangible influences as these. On the other hand, it is felt that Indian paper making will never achieve its full potential nor reach a position where it will be able to survive without generous protection unless these constraints are largely removed. Whether, or how soon, they will be eliminated is problematical, but it does seem likely that the standards of ability and the levels of performance of indigenous supervision will be advanced considerably during the next generations. Such progress is expected to occur as a direct result of increased training, and experience and as an indirect consequence of social, cultural, and economic changes in the Indian environment.

These attitudinal factors have been considered primarily from the standpoint of their influence on mill performance. They are also believed to have a bearing on the effectiveness of higher level management and administration or, in other words, on the proficiency of managing agency operations. As has already been seen, the degree of control which agencies exercise over the affairs of the paper concerns is so comprehensive that the structure and behavior of these managerial organisms are of patent significance to the future of the industry.

Domestic paper making has reached its present stage of development largely through the efforts of various managing agency houses. Although they have received periodic prods and assists from government sources, these agencies have provided the initiative, the capital, and the technical skills necessary to the establishment, operation, and expansion of most of the country's mills. They have done so in spite of many obstacles and adversities and in an environment which has not been overly favorable to industrialization. Not only in paper making but also in most other lines of industrial endeavor, they have been so successful in their way that they have virtually monopolized the functions of industrial management and entrepreneurship. In consequence, whatever advances are to be in the domestic paper industry must be implemented by various managing agencies if they are not to devolve on the Government.

This situation is not believed to be conducive to expansion of the industry along the most rational or economic lines. If India is to achieve optimum use of its paper making resources it will need, not a heterogeneous scattering of small-to-medium-scale, independent units as at present, but rather a lesser number relatively large size, multi-mill companies. If technological efficiency is to be maximized, most mills will have to have annual capacities of at least 15,000 tons, as already noted. If potential economies in the fields of management, finance, forest development, and marketing are to be realized, total company outputs on the order of 100,000 tons per year will probably be necessary. Since neither resources nor markets are sufficiently concentrated to warrant single mills of this latter capacity, multi-plant operations will be required. For each company, such operations would entail a considerable amount of product standardization in order to minimize production, transportation, and marketing costs. All mills would share the overhead expenses of research, administration, sales, and finance, while the total organization would reap the benefits of specialization, rationalization, and unified financial control. This is, of course, merely a recitation of some of the general advantages of large-scale operations. It is inserted here to point up the fact that although these economies are available to almost any large, unified, manufacturing concern, they are not all equally available within the organizational framework of a managing agency.

Operating within this framework, the agency cannot so coordinate and rationalize the functions of the separately owned companies which it directs as to achieve the efficiencies outlined above. Where a single agency manages two or more firms in the same industrial category it may be in a position to unify their activities through a merger of ownership. Until recently this has not been more than a theoretical possibility in the paper industry, since no agency managed more than a single integrated firm prior to 1950. In other manufacturing lines, however, where as many as one dozen firms producing approximately the same product have been directed by one agency, there has been scant evidence that the managers have ever sought to achieve the economies of unified operation via mergers.

Not only does the managing agency system fail to unify the operations of companies within a single management network, it also prevents the amalgamation of functionally similar companies which are under the direction of different agencies. Two agencies obviously cannot manage a single consolidated firm, and neither is likely to look with favor on a business transaction which would ultimately divest it of an income yielding subsidiary. It is not entirely an accident of fate that in the history of the Indian paper industry there has not been a single merger of two going concerns.

One further aspect of managing agency operation having a bearing on industrial growth, namely the allocation of limited managerial and capital resources between competing interests, merits mention here. In respect to managerial resources, it may be doubted whether the paper industry, which is at best only a secondary interest of the major agency houses, is accorded either the quality or quantity of this scarce factor which it would receive in a large organization devoted solely to paper making. As regards the allocation of finance, paper making probably fares neither better nor worse than other agency interests. The criticism here is the previously mentioned one that in deciding how it will distribute its capital resources, a managing agency is liable to be influenced as much by the extent of its investment in particular concerns as it is by the possibilities which the market offers for profitable investment. This situation may lead to a relatively inefficient use of capital and to a lethargic response to new opportunities.

Apart from the complex question of the merits and demerits of the managing agency system, there are several other phases of business management in which it is felt that certain changes conducive to industrial growth are to be desired. Such changes include advances in techniques of organization and of administration and more extensive interchange of production and administrative personnel. Optimum managerial performance will not be achieved unless more attention is devoted to such functions as cost accounting, industrial engineering, planning, and personnel administrations. Similarly, the most effective use of production personnel and facilities is unlikely to be realized unless there is better communication and exchange of ideas than now takes place between the central offices and the mills in most companies. The sharp separation which exists in many companies between mill staff and administrative staff is a real impediment to the coordination of all company functions.

Although the primary foci of observations and conclusions in this chapter have been the achievement of productive efficiency and the optimum utilization of resources, these are not the only aspects of industrial growth in which private enterprise has a significant role to perform. Still to be considered is the function of marketing, which forms the necessary link between production and consumption.

In some ways it is presumptuous for a Westerner to offer suggestions on merchandising techniques to persons as skilled in the arts of salesmanship and persuasion as are the majority of Indian merchants. On the other hand, the techniques of the bazaar at which these traders and shopkeepers excel are not entirely adequate for the distribution of a product such as paper. The merchants are relatively powerless to affect the sales policies of the producers, and it is the latter which are felt to be in the greatest need of reappraisal.

In considering these sales policies, it is necessary to remember that the customers of the paper mills fall into three main categories, i.e., large industrial consumers, wholesale distributors (who may also carry on a retail business), and the Government. For the 40 per cent of total product which goes to the Government, no sales effort is necessary, but for the 60 per cent left to the civilian market the same statement does not hold true--even though some firms seem to act as if it did. As long as there remains a general shortage of good quality paper in India, those companies whose products enjoy the best reputation in the market can sit back and wait for orders to pour in. This is not, however, the best way to pave the way for future expansion of consumption.

A necessary prerequisite to large-scale production for a mass market is product standardization. Such standardization implies the establishment of publicly acceptable specifications in regard to quality, size of sheet, etc., and the manufacture of products in strict accordance with these specifications. Neither effective and sustained control of quality nor industrywide agreement on size and grade standardization have yet been achieved by domestic paper manufacturers. When they are achieved the industry should meet with increased success in its efforts to wean customers away from their widespread preference for foreign made paper. It should also begin to realize the advantages of selling under a common label, products manufactured in widely scattered mills.

In their dealings with industrial consumers, the paper manufacturers have been criticized quite frequently for their failure to meet specifications and for their apparent indifference to special customer requirements. What the paper firms appear to need are well trained technical salesmen who can deal directly both with production men at the paper mills and with operating personnel in the consumer's plants. Widespread use of such technical sales personnel would probably result in the elimination of distributors from interindustry transactions, but it is felt that in sales of this type the services now performed by middlemen can be executed more effectively by manufacturers' representatives.

Outside of the industrial sector there are still extensive wholesaling and retailing functions to be performed by distributors. What these paper merchants are neither trained nor equipped to do, however, is to educate the public to novel product styles and uses, or to stimulate popular demand for new and unfamiliar grades and brands. If paper sales are to be promoted through the skillful use of advertising, packaging, and display techniques, the initiative and most of the financial outlay will have to come from the manufacturers. Up to the present time, impersonal sales promotion of this sort has hardly been used at all. Its nonuse may be attributed to widespread illiteracy, lack of competition between manufacturers, and the relatively small-scale of most paper making operations. As literacy spreads, as the outputs of paper companies increase, and as mass markets become a possibility, a drastic modernizing and revitalizing of paper merchandising methods and programs will probably become necessary.

As part of such a modernizing process, some of the larger firms may find it advantageous to integrate their operations down through the retail distribution stage. As an alternative to the complete integration of production and marketing functions, it should be profitable for certain of the firms to join together in cooperative groupings for sales purposes. This form of merchandising organization, which has recently been tried with some success in Western Europe, enables small producers to enjoy some of the economies of specialization normally reserved to larger units.[1] Under a cooperative group arrangement, a number of small mills agree to sell their products through common outlets, with each specializing in the manufacture of a limited number of grades and sizes. In this way the marketing units are able to carry full product lines while the mills reduce production costs by eliminating the waste inherent in small lot manufacture and frequent specification changes. This approach, it may be noted, is not the same as that of the India Paper Sales Association (see Chapter 6) which merely acts as the representative, in a particular market, of three firms making virtually the same products.

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[1] See Taylor, Edmond, "The Plane, the Blast Furnace, and the Shoemaker," The Reporter, New York, November 18, 1954, p. 27.

In evaluating the performances of the paper concerns and in itemizing the limitations and omissions observed in various phases of their activities, one question of fundamental importance keeps recurring. The question is this: what need or incentive is there for the majority of these firms to incur the effort and the expense of doing the things which this study recommends that they do? If, as is the case with all of the major producers, they can sell at a good profit all of the paper which they can make, why should they attempt to improve quality, stimulate demand, or provide better services? If present methods of manufacture are good enough to yield handsome returns, why incur the risks, pains, and problems inherent in technological change, rationalization, and retrenchment? Under existing economic and political conditions, sound business judgment may indicate that safe and conservative policies are the most profitable, and that the limited rewards of progress do not justify their costs.

It is the writer's belief that, if the pulp and paper industry is to achieve something approaching optimum performance, it will need the stimulus of a more competitive operating environment and of a more effective system of economic rewards and punishments than it has experienced since 1939. A quickening of industrial initiative and activity can probably be accomplished more readily through modifications in government policies than through changes in any other variable. The relationship of government policy to the welfare and growth of Indian paper making will be discussed in the following and final chapter.

CHAPTER 12

Government Policy and the Growth of Paper Making

It will be recalled from earlier chapters that there are relatively few aspects of the paper industry which do not involve contact, in one way or another, with representatives of the central or state authorities. The paper manufacturers meet the Government in many guises. They deal with it as supplier of materials and services and as consumer of finished products; as levier of taxes and as grantor of financial assistance; as guardian of worker welfare and as arbiter of labor relations; as establisher of prices and as determiner of significant elements of cost; as sponsor of research and as fellow producer of paper. Of greater significance to the growth of paper making than any of the above mentioned relationships are those which have resulted from government policies of fostering economic development and social progress and of protecting indigenous industries from external competition. It is with these latter policies and relationships that this chapter is chiefly concerned.

In accordance with its Five Year Plan, whose avowed objectives are: "maximum production, full employment [and] the attainment of economic equality and social justice,"[1] the Government has assumed broad responsibilities for directing the course of the nation's development. In implementing the aims of the Plan it has undertaken to allocate resources, to control foreign exchange, to limit imports, to regulate industrial expansion, to foster cottage industries, to subsidize housing programs, to engage in multi-purpose river valley projects, to nationalize selected industries, and to perform a legion of other activities. While carrying out these many functions, the central authorities have been faced with a series of difficult decisions involving the choice of methods to be used and the resolution of conflicting demands among competing objectives. In a number of cases, ideological intentions have been forced to yield to economic realities, whereas in other instances the demands of economic growth have had to make concessions to pressures for social reform. The shaping of official policy towards the development and expansion of paper manufacturing has been characterized by conflicts and compromises of this nature.

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[1] The First Five Year Plan--A Summary, op. cit., p. 8.

The decision of the Government to set itself up as over-all controller and coordinator of the growth and performance of industries in the so-called private sector, has placed it (the Government) in somewhat of an ambiguous position. It has had to give up, or at least to postpone to an indefinite future date, its earlier plans for nationalizing most of the means of production, but it has not abandoned its intention of achieving "a progressive widening of the public sector and a reorientation of the private sector to the needs of a planned economy."[1] Such a policy is not one to give comfort or encouragement to private enterprise, yet the central authorities have publicly stated that, without the active help and participation of the latter, the targets of the Five Year Plan will not be reached. The position of the State, in effect, is this. Having long been suspicious of capitalism, and having given up its former schemes of nationalization more from necessity than out of conviction, it now finds itself obligated to foster the growth of an economic institution (private enterprise) of whose vitalizing force (the profit motive) it still disapproves.[1] Not only does the Government tend to look askance at profits, it also appears to be convinced that planning and control from the top are bound to be more conducive to economic progress than are competition or the operation of a relatively free market. These points of view cannot be attributed entirely to doctrinaire socialist thinking but are probably based, at least in part, on a fairly realistic appraisal of the past performance of capitalist enterprise in India. Needless to say, the behavior of business interests has frequently left much to be desired, and the record of industrial management has not always been of a nature to inspire confidence in its integrity, far-sightedness, or dynamism. On the other hand, if conditions in paper manufacturing are at all indicative of trends in the rest of the industrial sector, there is reason to believe that industrial leadership in India is becoming increasingly progressive and responsible.

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[1] Ibid., p. 9.

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[1] To many Indian minds the word profit implies exploitation and the concept of profit as a necessary motivating force in an unregimented economy is not clearly seen. An illustration of this attitude was given in Chapter 4 in the discussion of Government calculations of paper prices. It will be recalled that a return of 8 per cent on fixed capital was all that was allowed to cover managing agency commission, corporate income taxes, reserves, and dividends.

Having acknowledged the importance of the contribution of business enterprise to the fulfillment of the goals of the Five Year Plan, the Government would not be ill-advised to reshape some of its policies towards the business community so as to maximize that contribution. Although it has judiciously encouraged industrial expansion through financial aids and by depreciation concessions in the income tax laws, the State does not yet appear to have recognized that the best efforts of private enterprise will not be forthcoming in an economy which is so tightly controlled that there is little scope for individual or competitive activity. What the private sector appears to need most from the Government is a greater area of freedom for legitimate business and industrial activities plus the assurance that if it performs responsibly and efficiently it need have no fears of nationalization or regimentation. It is not contended here that state planning and participation in the private sector will not continue to be necessary, but that these functions should supplement rather than substitute for those of business enterprise. It is felt that officialdom should think more in terms of inducing industrial growth and less in terms of directing it.

Efforts by the Government to encourage the development of the indigenous paper industry by reserving for it most of the domestic market have met with mixed success in the past. The problem has been that of providing an economic climate favorable to expansion without concurrently subsidizing an excessive amount of inefficiency. Under the aegis of almost three decades of tariff protection the industry has raised its annual output from 27,000 tons in 1924-1925 to 138,000 in 1953. Since 1925, twelve new mills have come into being, the production of Indian managed firms has surpassed that of British controlled units, and the manufacture of paper from bamboo has evolved from the laboratory stage into a large-scale industrial operation. In contrast to these indications of significant progress have been certain other less favorable facts. These have included the failure of the majority of mills to approach what might be considered efficient performance and the inability of the industry to dispense with heavy tariff protection. It is clear from the reports of the various Tariff Boards, dating back to 1925, that those bodies neither anticipated nor recommended that the paper industry should enjoy a perpetual and protected infancy. Nonetheless, twenty-nine years after the first import duty was imposed, the industry finds itself enjoying greater tariff protection (39.4 per cent on printing and writing paper) than ever before in its history. Not content with this degree of protection, industry spokesmen have continued with some success to press the authorities for outright exclusion of all imports which compete in any way with domestic production. The desire of the paper makers for an eternally subsidized existence is more readily understandable than is the apparently increasing willingness of the Government to accede to this condition.

It is believed that complete removal of duties and quotas on foreign paper at the present time would create chaos in the domestic industry. Only the minority of more efficient firms would be able to stand up to external competition and even those units would find it necessary to make drastic changes in their production and sales policies. They would probably still be able to manufacture cheap white printing and writing papers at a profit, but it is doubtful if they could compete with imports of specialty papers, wrappers, and paper boards.[1] However, the inability of the industry to dispense entirely with its protective mantle at this stage does not warrant the conclusion that the Government's decision to foster the growth of indigenous paper making by imposing protective tariffs was economically unsound.[1]

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[1] These conclusions, which are based primarily on talks with mill officials and paper experts, are consistent with such limited and approximate international price comparisons as it was found possible to make. See, for example, Indian paper prices as given in Chapter 6, and U. S. paper prices listed in the Commodity Yearbook 1954, Commodity Research Bureau, New York, p. 260.

It is regretted that dependable data, which would have permitted specific comparisons between the prices of Indian made papers and of foreign papers of equivalent types and grades, in 1953, could not be obtained. Among the barriers to the procurement of such data were: (a) the reluctance of paper concerns and associations to reveal price information; (b) the variability of prices from company to company and from country to country; (c) fluctuations in prices over time; and (d) the Indian Government's current policy of virtually excluding foreign papers which are similar enough to indigenous varieties to compete with them.

In espousing an autarkic policy with respect to the paper industry, it is believed that the central authorities accomplished a number of objectives which would have remained unrealized under free trade. Available evidence indicates that without protection the industry might well have expired. Even if it had managed to survive, it would have reached only a fraction of its present size. Behind a protective barrier it has grown and prospered. In doing so it has utilized otherwise idle resources, helped to conserve the nation's limited balances of foreign exchange, contributed substantially to national product, and freed the country from its dependence on external sources for the supply of a vitally needed commodity.

In view of India's unquestioned paper needs, the most significant test of the economic wisdom of granting protection to the indigenous paper industry lies in the answer to the following question. Would the use of its internal resources yield the country a greater value of finished paper, (a) if employed directly in manufacturing this commodity, or (b) if utilized to produce an exportable product which could be sold abroad in order to import foreign made paper? If account is taken, first, of the unsuitability of the bulk of indigenous paper making materials (see Table V, Chapter 3) for use in the manufacture of export products; second, of the fact that Indian paper prices have been comparable, for the most part, with those of foreign papers in recent years; and third, of the country's persistent difficulties in finding adequate external markets for the export commodities currently produced (e.g., jute goods and cotton textiles); then the first answer may be the correct one. That is to say, India is getting more paper per unit of resources through indigenous manufacture, than it could by making alternative products for export and purchasing its paper from abroad.[1]

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[1] For a clear and discerning summary of pertinent factors to be considered in evaluating the foreign trade policies of underdeveloped countries, see United Nations, Department of Economic Affairs, Measures for the Economic Development of Under-Developed Countries, New York, May, 1951, pp. 56-58.

The amount of foreign exchange conserved through indigenous paper making in any one year cannot be calculated precisely because of differences in the levels and the behavior of Indian and of world paper prices. In addition, there is no way of determining exactly how large a deduction from the value of a year's domestic paper output must be made for consumption of imported paper mill machinery and chemicals. Nonetheless, an indication of the magnitude of this saving can be inferred from the following figures. The value of indigenous production in 1952-1953 was calculated in Chapter 1 to be Rs. 187 million. From this figure may be subtracted Rs. 4.6 million for pulp imports, Rs. 10

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[1] This inference must be qualified by pointing out that it is of necessity based only on an intensive study of a single industry supplemented by a general knowledge of other aspects of the Indian economy. In the absence of a comprehensive and dependable input-output study of the total national economy, conclusions as to the wisdom of encouraging the growth of particular industries cannot be drawn with the degree of precision or certainty one could wish for.

million to cover the cost of imported chemicals, and Rs. 9.1 million for depreciation of foreign made machinery.[1] These deductions leave a balance of more than Rs. 163 million as one estimate of the savings in foreign exchange.

A third way in which the domestic paper industry has served the national interest has been in freeing the country from its dependence on unreliable foreign sources of supply. In times of international crises or of worldwide paper shortages, countries which do not produce their own paper may be almost entirely deprived of this commodity and may have to pay excessive prices for such supplies of it as they are able to obtain. India's paper and paperboard imports, which stood at 153,633 tons in 1938-1939, were cut to a mere 19,188 tons by 1943-1944, during World War II. Over this same period the average price (before duty) of these imports rose from Rs. 210 to 929 per ton. More recently, shortages induced by the Korean War caused the average price of India's paper and board imports to rise from Rs. 906 in 1950-1951 to Rs. 1530 in 1951-1952, and the price of imported woodpulp to shoot up concurrently from Rs. 606 per ton to Rs. 1950 per ton.[2] Although indigenous paper prices have followed over-all international price trends, they have neither exhibited the sharp fluctuations nor approached the peak levels of import prices, as can be seen by a re-examination of Fig. 4 in Chapter 6.

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[1] The pulp cost was derived by multiplying an estimated consumption of 4,000 tons of woodpulp by prices calculated from statistics in Foreign Sea-Borne Trade of India, op. cit., 1953. The figure for chemicals is an arbitrary estimate necessitated by lack of specific data. It is believed, however, to be much more than adequate to cover actual import costs. The depreciation deduction is 10 per cent of total paper mill machinery import values for the preceding ten years. The latter values were extracted from Foreign Sea-Borne Trade of India, op. cit. supra., 1945 to 1953.

[2] All figures cited in this paragraph were derived from issues of the Foreign Sea-Borne Trade of India, op. cit., for the years in-

While it is felt that a valid juvenile industry case can be made for Indian paper making, it is not contended that protection should be either of indefinite length or of unlimited exclusiveness. Because the Indian cultural and economic environment is believed to be less hospitable to the growth of manufacturing than are conditions in Western countries, the paper industry will undoubtedly require a longer period of shielded growth than was anticipated earlier. In addition, the mills can legitimately claim a modicum of governmental assistance to compensate them for the high prices they must pay to the heavily protected domestic chemical producers. On the other hand, unless the paper manufacturers are faced with the not-too-distant prospect of having to operate under relatively competitive conditions, it is unlikely that they will ever become really efficient or will make their full contribution to the country's economic advancement.

The stimulus to competition need not be an external one exclusively, but it is believed that domestic mills are likely to be more sharply challenged by imports bearing a low rate of duty than they are by one another's products. For this reason it is felt that the present trend towards increasing protection is an unhealthy one. It

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dicated. Price quotations, not shown directly, were obtained by dividing tonnage figures into value totals.

would be better for the industry if a gradual reduction in tariff levels were to be instituted. How far and how fast such a reduction should take place would necessarily depend on comparative market conditions at home and abroad over the coming years. It would also depend on an evaluation of the conditions required for stimulating increased investment in paper making facilities. The readmission of large amounts of foreign made paper to Indian markets would almost certainly goad the more important indigenous mills into better performance but it might at the same time discourage desirable investment in new or expanded mills.

Government policy at the present time is directed more towards fostering growth than towards eliciting efficiency. This approach seems to imply that once expansion has been achieved, effective performance can then be required. Although such a policy is not entirely unrealistic, there are certain hazards associated with it. There is no reason to suppose that large firms will of their own accord behave any more competitively than small ones, and there is some reason for thinking that they may be better equipped to control competitive forces and to influence official policies. If the Government wishes to bestir the domestic industry to more dynamic behavior without lowering the barriers to imports, it will have to take steps to stimulate internal competition. One such step might be to give greater encouragement to foreign investment in this industry.[1] A second step might be to foster the growth of indigenous capacity somewhat in excess of anticipated demand. In addition, it is felt that paper prices in the civilian market could be set free to find their natural levels, while collusion between companies to set prices, to restrict output, or to divide markets could be forbidden.[1]

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[1] At the present time, it is not clear whether a foreign concern would be allowed to establish a paper mill in India, even if

Of comparable importance to the adoption of government policies which will encourage both expansion and superior performance is the resolution of existing conflicts between the demands of productive efficiency and those of social welfare. Although the necessity of choosing between investment and consumption is well appreciated by the country's top planners, it is not so clearly understood by many state officials or by the general public. As a result, industry finds itself subjected to a number of contending forces and pressures. To begin with, it is expected to manufacture an acceptable product at a reasonable price and to expand its output in accordance with the targets of the Five Year Plan. In addition, it is obligated to provide

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it sought to do so. The Government's policy of not instituting a set of general principles governing the admission of foreign enterprises, but rather of judging each application on its own merits after careful screening, leaves this matter in some doubt. The fact that paper making, as contrasted for example with oil refining, is an industry in which domestic enterprise has done a fairly adequate job in meeting current demands would probably militate against the admission of a foreign concern into this field. For Indian policy towards new foreign investment, see Investment in India, op. cit., p.2.

[1] If cooperative groupings should be instituted for marketing purposes, as suggested at the end of the preceding chapter, certain exceptions would have to be made in any general ban on interfirm collusion.

increasingly generous returns to its employees in the forms of wages, housing, insurance, and other benefits. Finally, it is supposed to make a major contribution to the solution of the country's critical unemployment problem. In the long run, over-all industrial expansion can and probably will alleviate or satisfy all of these pressures and expectations, but to require individual firms to do the same thing on a short run basis is to endanger the whole process of economic development.

If companies are to grow and prosper without state aid they must be able both to set aside substantial reserves for reinvestment, and to declare large enough dividends to attract private capital. They may not be able to fulfill either of these requirements if they are overburdened by having to carry exeessively large work forces at relatively high rates of wages and of per capita benefits. The conflict here is not merely between the claims of investment and of consumption. There is involved a further contest between the welfare objectives of increased employment and of expanded individual incomes. Companies can pay high wages and provide generous benefits if they are also able to rationalize production, introduce modern technology, and increase labor output in proportion to these additions to labor costs. Alternatively they can employ large work forces if they use primitive methods and pay low wages. The only way in which manufacturers can increase worker productivity while concurrently maintaining employment levels (or vice versa) is by expanding their capacities. Although expansion may provide an ideal solution to the employment-productivity dilemma in some instances, it is not always a feasible answer to the problem. This is especially true in the paper industry, where capacity increases, often made in large, discontinuous steps, frequently entail substantial capital investments.

It is recognized that, in attempting to resolve contending economic and social objectives into a positive program, the Government must respond to political pressures as well as to the dictates of economic wisdom. Nonetheless it is felt that official policies toward industrial productivity, worker welfare, and unemployment could be better coordinated and more realistically spelled out. In particular there is a need for more widespread recognition that the creation of employment opportunities is a valuable by-product of industrialization but that it is not the primary function of that process. The point needs to be made and reiterated that the purpose of industrialization is not to manufacture and perpetuate jobs but rather to create the most value at the least cost through the optimum use of all of the factors of production. If the Government is to achieve its ultimate goals in the field of industrial development it will do well to place more emphasis on efficiency in the use and combination of all resources and less on the excessive use of one. It will do far better to take tax revenues from profitable and productive enterprises for providing employment in much-needed public works schemes, than to encourage inefficiency and stagnation by overburdening the industrial sector with unproductive labor.

Although attention has been called in this chapter to a number of anomalies and limitations in official policies relative to the growth of indigenous paper making, it is felt that, for the most part, the Government has done an exceedingly competent job in organizing and in encouraging industrial development. In view of the enormity of the total development problem, outside of the industrial sector as well as within it, and in light of the cultural, political, educational, and economic obstacles to be overcome, the progress which has been made since independence was achieved, in 1947, is truly impressive.

In recent years, the political climate in India has become considerably more auspicious to private industrial investment and expansion than it was at the time of independence. Official policy has lost much of its former ideological rigidity and has shown resilience in adapting to changing conditions. Concurrently, government administrators have increased in knowledge and experience and have evinced the ability to integrate imaginative planning with realistic appraisals of what can actually be accomplished in specific industries. These trends, combined with the demonstrated success of the Congress Party in giving the country a stable and continuing democratic administration, lead the writer to conclude that in the foreseeable future, Government policies will, on balance, be favorable to the continuing growth of the indigenous pulp and paper industry.

APPENDICES

APPENDIX I

Note on Method

The method followed in doing the research for this case study of industrial development is summarised briefly below.

The research began with six months of preparatory work in the United States. This involved the acquisition of a general background knowledge on the history, geography, culture, economy, and political organization of India, plus a compilation of such information as was available on the Indian paper industry. During this initial stage, the writer was fortunate in being able to visit a number of American paper mills and in being able to associate with the Indian research projects of the Center for International Studies and of Professor Charles A. Myers, of M.I.T. On the basis of the data thus acquired, a detailed series of questions relating to the structure, growth, and behavior of the industry to be studied was formulated, subjected to criticism, and several times revised. This combined questionnaire and outline served as a valuable guide in the subsequent search for and selection of material.

Most of the data obtained in the course of an eight months stay in India came from one of the following sources: (a) talks with the personnel and inspection of the records of the paper mills and of their respective managing agencies; (b) interviews with government officials and others having a knowledge of the paper industry;

(c) talks with a host of individuals, from a wide variety of backgrounds, who contributed to the writer's understanding of the country; and (d) study of recorded material in libraries and organization files.

The approach to the paper industry was made indirectly by first contacting such helpful intermediaries as the Indian Consul General in New York, India's Permanent Representative to the United Nations, the Director of the Ford Foundation's operations in India, the Editor of the Eastern Economist, and personnel of the U. S. Embassy and of the U. S. Technical Cooperation Mission in New Delhi. Introductions were obtained from these sources to the Development Wing of the Ministry of Commerce and Industry, to the Federated Indian Chambers of Commerce and Industry, to the Bengal Chamber of Commerce, and to the Indian National Chamber of Commerce. Further introductions were then acquired through these organizations to the managing agents or to the managing directors of the country's twenty paper mills.

The writer was privileged to visit nineteen of these twenty mills and to obtain from the managers of the one unit not visited, a detailed report on its facilities and operations. Mill visits were from one to four days in duration. They were almost always arranged in advance through the managing agencies and generally entailed sojourns in company guest houses or with mill supervisors. Each visit consisted of a tour of the mill and of interviews with department heads, key management personnel, and (occasionally) labor leaders. Information obtained in this way was usually supplemented by calls and interviews at the general offices of the managing agents. A useful perspective on the operations of the paper companies was secured by visits to important centers of the hand-made paper industry, in Poona and near Jaipur, as well as by tours of a variety of large, medium, and cottage-scale industries engaged in the manufacture of other products.

A considerable amount of valuable data was acquired through interviews, supplemented by correspondence, with well-informed and helpful officials of the central and state governments. Departments and offices of the Central Government which were contacted included: the Planning Commission, the Development Wing of the Ministry of Commerce and Industry, the Forest Research Institute, the Ministry of Labor, the Labor Bureau, and the Department of Commercial Intelligence and Statistics. State officials from whom assistance was obtained included representatives of Departments of Forestry, of Commerce and Industry, of Labor, and of Small Scale Industries.

Among the nongovernment institutions whose personnel and records provided significant information for this study were the Food and Agriculture Organization of the United Nations, the Indian Standards Institute of Delhi, the publications, Capital, and Indian Pulp and Paper, and the brokerage house of Place Siddons and Gough--the last three institutions all being located in Calcutta. Insights into the marketing and distribution of paper were obtained not only from the manufacturers, but also from merchants and importers in the major cities, from the Calcutta Paper Traders Association, and from a number of industrial consumers.

The financial records of the paper concerns were found in the files of the Registrars of Joint Stock Companies of the states in which the concerns had their offices. Other historical, financial, and statistical records were found in the following libraries: The National Library, the Commercial Library, and the libraries of the U. S. Consulate and of the Bengal Chamber of Commerce (all in Calcutta), and the library of the Delhi School of Economics, in Delhi.

The material acquired from all of the sources noted above has been organized, tabulated, and integrated into this report over a period of eight months.

APPENDIX II A

Totals of Annual Imports and Exports, Production and Consumption of Paper and Paperboard in India, 1923-24 to 1952-53 (a)

(all figures in thousands of tons)

YEARS	IMPORTS	EXPORTS	PRODUCTION	APPARENT CONSUMPTION
1923-24	69.5	*	26.3(b)	95.8
24-25	84.9	*	27.0	111.9
25-26	87.4	*	28.2	115.6
26-27	100.4	*	31.7	132.1
27-28	104.5	*	34.7	139.2
28-29	115.6	*	38.2	153.8
29-30	137.0	*	38.6	175.6
1930-31	114.7	*	39.6	154.3
31-32	109.5	*	40.6	150.1
32-33	133.0	*	40.2	173.2
33-34	128.2	*	43.7	171.9
34-35	146.9	*	44.6	191.5
35-36	166.6	*	48.0	214.6
36-37	160.1	*	48.5	208.6
37-38	181.6	1.5	53.8	233.9
38-39	153.6	1.5	59.2	211.3
39-40	135.1	2.4	70.8	203.5
1940-41	105.1	4.8	87.7	188.0
41-42	65.4	4.3	93.5	154.6
42-43	20.8	0.3	91.0	111.5
43-44	19.2	0.1	101.0	120.1
44-45	33.6	*	106.0	139.6
45-46	54.9	*	108.4	163.3
46-47	84.1	0.7	103.4	186.8
47-48	112.9	0.6	93.7	206.0
48-49	140.8	0.9	98.2	238.1
49-50	112.3	0.4	104.4	216.3
1950-51	109.4	1.7	114.0	221.7
51-52	91.3	3.3	135.1	223.1
52-53	106.5	1.7	136.8	241.6

* Less than 100 tons.
a) For sources of this material see footnote to Fig. 6, Chapter 10.
b) My own figure based on mill records.

APPENDIX II B

Annual Imports of Paper and Board into India by Major Categories, 1923-24 to 1952-53(a)

(all figures in thousands of tons)

YEARS	PRINTING & WRITING	NEWSPRINT	PACKING & WRAPPING	OLD NEWSPAPERS	PAPERBOARD & MILLBOARD
1923-24	18.0	10.0	4.9	22.1	10.6
24-25	20.1	17.8	7.0	25.7	10.9
25-26	19.1	13.7	8.8	28.3	13.7
26-27	19.0	20.9	10.4	32.9	13.6
27-28	21.8	16.0	12.3	35.1	15.9
28-29	28.5	17.0	11.4	37.4	16.3
29-30	28.2	24.3	14.3	45.6	18.9
1930-31	20.5	21.5	11.6	41.1	15.4
31-32	18.9	19.9	10.2	41.9	13.8
32-33	18.7	22.8	16.2	47.4	21.0
33-34	20.5	25.6	12.5	47.4	15.9
34-35	19.3	25.4	15.7	58.0	20.8
35-36	23.8	34.3	20.3	57.6	24.8
36-37	20.4	36.7	18.2	54.7	24.2
37-38	26.8	43.2	25.5	48.8	31.7
38-39	22.6	32.6	19.4	47.4	27.1
39-40	16.8	36.7	18.9	33.3	25.6
1940-41	8.5	30.7	9.5	35.7	17.2
41-42	4.7	28.3	6.8	12.5	10.1
42-43	1.4	11.2	2.1	1.1	2.6
43-44	1.8	10.4	3.7	*	1.6
44-45	2.6	22.4	2.9	*	2.8
45-46	15.2	25.7	7.2	*	3.6
46-47	21.0	29.8	9.5	14.1	4.5
47-48	24.9	43.9	9.3	21.1	5.7
48-49	49.6	58.2	17.3	0.7	8.3
49-50	18.8	44.7	7.1	24.2	13.6
1950-51	8.5	75.2	6.8	2.8	3.3
51-52	12.1	50.5	11.2	7.5	4.1
52-53	18.2	54.3	11.2	13.3	4.8

* Less than 100 tons

a) All data in this table derived from issues of *Annual Statement of the Sea-Borne Trade of India*, *op. cit.*, for appropriate years.

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